

THE AMERICAN JOURNAL OF PSYCHOLOGY

Founded by G. STANLEY HALL in 1887.

VOL. VII.

JANUARY, 1896.

No. 2.

SEX AND ART.¹

BY COLIN A. SCOTT,

Fellow in Psychology, Clark University.

Introductory. In the following pages the attempt is made to connect, on a psychological basis, extremes, which as early as the time of Socrates² were felt to be in vital relationship with each other. In modern times, Schopenhaur³ may be said to have treated the metaphysics of the subject, but its psychology, despite the increasing interest in each of the terms involved, has heretofore been neglected. The present article bases the connection on the one hand, the equivalence and interchangeability on the other, of the sexual passions (including the Anger-Fears) and the more intellectual instincts of Art, Religion, and the interests and enthusiasms generally, upon the fundamental quality of erethism found in every animal cell. The psychological expression of this bodily state is traced from its simplest manifestation, through animal combat and courting, the courting of the lower races, and the ensuing and accompanying religious, dramatic, and otherwise symbolic phenomena of Phallicism (all to be regarded as essentially subdivisions of courting) to the more complex conditions of modern times. Sexual perversions are regarded as atavistic degenerations, failures, or fetichisms of the psychological laws of courting. Modern art is represented as being

¹ In the preparation of this article I have much pleasure in acknowledging the kind and sympathetic assistance of Pres. G. Stanley Hall, by whom the subject was suggested, and with whom I conferred frequently in its elaboration.

² Cf. Plato's "Symposium."

³ Cf. his doctrine of "Will (of which the focus is sex) and Idea."

the psychical expression of an erethism which is an equivalent, and historically a derivative, of that of sex; and as being therefore an overflow of some of the deepest emotions as well as a product of the intellectual capacities. A plea is thus entered for the emphasis of those activities which will form the noblest and most natural irradiations of this plastic and variable passion of sex. A full portrayal of the facts which support this view has not been possible within the limits of a single article. References are, however, made in sufficient number, it is hoped, to enable the reader to complete the picture by efforts of his own.

Erethism. The phenomenon of erethism is one which involves the most profound and varied elements of the bodily structure. It is indeed a constant accompaniment of animal life. The amœboid movements of the protozoa show this function in operation indifferently at any portion of the body and before the differentiation of any subservient structure, while the alternate erection and flaccidity of the metazoan cell, shown by Mosso, Hodge, and others, to depend upon nutrition and to correspond to states of activity and fatigue, carry this function into every part of the most highly developed organism. Among the higher animals this capacity differs with different tissues and groups of cells, with the age and constitution of the individual, and with sex, while it often seems to follow a certain rhythm not directly dependent upon the environment.

At no period in the life of the individual is the phenomenon of erethism more evident and more important than at the time of reproduction. Balbiani describes the extraordinary agitation of the paramœcia, which, he thinks, the want of nourishment is not sufficient to explain. "They seek and pursue each other, go from one to the other, touching with their cilia, sticking together for some moments in the attitude of sexual contact and then freeing themselves in order to join some other. These curious plays by which these animalcules seem to provoke each other to sexual union last often many days before they become final."¹ The conjugation of these animals depends, it is to be observed, upon the local erethism and erection of corresponding portions of their bodies through which their union is effected.

With the paramœcia there are no permanent sexual organs. The whole of the body is the medium of excitement, and the whole living contents of each body flow together and are individually lost in the act of conjugation. Among the metazoa, on the contrary, a portion only of the body is usually sacrificed,

¹ Beaunis, "Sensations Internes," p. 51.

but this sacrifice is accompanied normally by an evolution and loss of energy which profoundly affect the organism and which often result in exhaustion and sometimes in death. With the metazoa, also, as specialization advances, the sexual erethism becomes accented in certain directions. Definite sexual organs become developed. The reproductive glands, organs of intromission, of stimulation and attraction, make their appearance, while the nervous system, itself a highly erethic tissue, comes to bind together these different organs and unite them with the organism as a whole.

That the capacity for sexual erethism is closely connected with the physiological condition mediated in the higher animals by the sympathetic system, and that it acts and reacts upon it, is shown by the effect of climate, food, drugs, hunger, disease, age, and hereditary constitution, in favoring or retarding reproductive functions. The sympathetic nervous connection between the generative organs and the stomach and alimentary canal, for example, is one which is exceedingly close. Says Dr. Edward Tilt:¹ "The debauché and the roué are frequently at a loss for terms to express the annoyance of their sufferings at the pit of the stomach." These sensations—"of gnawing and tearing, sinking and faintness, rawness, not pain, but an irritation worse to bear than pain"—are due, he thinks, to the too great reaction of the sexual organs on the central sympathetic ganglia.

Drugs which stimulate the glandular activity, especially of the skin, act also as aphrodisiacs. The effect of baths in either stimulating or allaying sexual feeling shews the connection with the skin. Moderate muscular activity acts directly on the erectile muscles and indirectly through the nervous system. To quote LaGrange:²

Bringing the muscles into action always produces important modifications in the processes of the great organic functions. There is an active congestion of all the organs during violent exercise, hence more active performance of function.

The indirect action through the brain may be of still greater importance.

Stimulation of the brain may be very great under the influence of active congestion brought about by muscular action. It is possible to be made drunk by movement, and in certain brains predisposed either by their native organization or by exalted ideas or passion, muscular action is often the prelude to actions resembling those of intoxication and even of madness.

The effect that a muscular exercise has in thus extending a

¹"Change of Life," p. 96.

²"Physiology of Bodily Exercise," p. 28.

state of erethism may help to explain the apparently unnecessary activity of many animals preliminary to copulation.

Beaunis¹ notes the importance of the somatic background in sexual excitement. "Sexual sensations," says he, "are functional sensations. Here the whole functional apparatus appears to be constituted for the most lively and exalted enjoyment." The numerous nervous fibres and the end organs (genital corpuscles) are not, he thinks, sufficient to account for this. The cause must be sought rather in the relations which exist between the genital apparatus and all the other parts of the organism. These relations are very evident at the time of puberty. When the generative apparatus acquires its development, the other organs participate in the impulsion. This is due to the nervous connection rather than to that of the blood. Every modification of the sexual organs and every excitement will then have its effect on the nervous system and through it on the whole organism, nervous centres, voluntary and involuntary muscles, heart and vessels, glands, etc.,—everything is affected. As the local excitation gradually increases, so does that of the general system. One has all the conditions of an excess of functional activity and of exceptional intensity.

Clouston² gives an interesting case showing the intimate connection of the sexual erethism with the brain.

A gentleman at the age of forty-nine had been for twenty-six years subject to regularly recurring brain exaltation every four weeks. The *visus generativus* is greatly increased, and he says that if in that condition he has full and free seminal emissions during sleep the excitement passes off; if not it goes on. Full doses of bromides and iodides and sometimes a long walk will stop the excitement and sometimes not.

And in another place:

American physicians tell us that there are some schools in Boston that turn out young ladies so highly educated that every particle of their spare fat is consumed by the brain-cells that subserve the functions of cognition and memory. If these young women do marry, they seldom have more than one or two children, and only puny creatures at that, whom they cannot nurse, and who either die in youth or grow up to be feeble-minded folk. Their mothers had not only used up for another purpose their own reproductive energy, but also most of that which they should have transmitted to their children. . . . Why should we spoil a good mother by making an ordinary grammarian?³

Sex itself plays an important part in determining the erethic condition. According to Geddes and Thompson,⁴

¹"Sensations Internes," p. 242.

²"Mental Diseases," p. 223.

³Cf. also Edward Clarke, M. D., in "Sex in Education," 1880.

⁴"Evolution of Sex."

we must recognize a male and female diathesis. The quality of "maleness" consists in activity, energy, variability, the production of a greater abundance of waste products, and is typified by the ever restless sperm cell; that of "femaleness" in quiescence, greater power of nutritive absorption, and less power to evolve energy. "The males are stronger, handsomer, or more emotional, simply because they are males, *i. e.*, of more active physiological habit than their mates. . . . The males live at a loss, are more katabolic — disruptive changes tending to preponderate in the sum of changes in their living matter or protoplasm. The females, on the other hand, live at a profit, are more anabolic—constructive processes predominating in their life, whence, indeed, the capacity of bearing offspring." "The greater preponderance in the females of the higher animals of the sympathetic, and in the male of the cerebro-spinal system as well as his greater muscularity, would be a natural outcome of this difference.

Erethism of any kind in both male and female represents a katabolic crisis, and while depending upon a more stable past physiological condition, is itself disruptive in its nature. A sudden check in food will greatly increase multiplication among lower forms. In some cases "the female forms numerous germ cells and terminates her individual life by bursting." "Both Weismann and Goette note how many insects (locusts, butterflies, ephemerids, etc.) die a few hours after the production of ova. The exhaustion is fatal and the males are also involved. In fact, as we should expect from the katabolic temperament, it is the males which are especially liable to exhaustion. . . . In higher animals the fatality of the reproductive sacrifice has been greatly lessened, yet death may tragically persist even in human life as the direct nemesis of love."¹

But not only of reproduction, of life itself it might be said that it is a masterly retreat toward the grave. The process of the years has nevertheless succeeded in bringing about a continually wider margin for the individual. We die, but we have learned to live in doing so. Hence it is not strange that the sexual life, rooted as it is in death, has become so richly provided with a margin of health and energy that its normal activity conserves and stimulates the organism instead of necessitating its destruction. The moderate bearing of children, despite its physiological expense, is well known to be conducive to health. Minot² shews that with the guinea

¹ Geddes and Thompson, *op. cit.*

² *Journal of Physiology*, May, '91.

pig the production of offspring is a stimulus to growth. Neither should coition have an injurious effect. Says Lallemand, as quoted by Acton:¹ "When connection is followed by a joyous feeling, a *bien être général*, as well as fresh vigor; when the head feels lighter, the body more elastic and ready for work; when a greater disposition to exercise or intellectual labor arises, and the genital organs evince an increase of vigor and activity, we may infer that an imperious want has been satisfied within the limits necessary for health. The happy influence which all the organs experience is similar to that which follows the accomplishment of every function necessary to the economy."

Specialization. The movement of specialization in the sexual organs and the functions of erethism has had for starting point the reproductive cell. At first, almost any cell suffices as a germ. Later, tissues of comparatively undifferentiated cells are set apart, as ovaries and testes. Morphologically, these glands differ from others in arising from the mesoderm. Functionally, they are characterized by their capacity for erethism, their marked periodicity, and their reciprocal action upon the rest of the organism. During the mating season they are found to be greatly swollen and gorged with blood. In man, hysteria, epilepsy, and erotomania are closely connected with a morbid erethism of these glands, while their loss frequently causes profound physiological changes, more marked, indeed, than the loss of any other organ not necessary to the life of the individual.

But, although these glands are the starting point, and always retain their primary importance, it is not long before accessory organs are developed which, in awakening the superadded sexual activities, stand between the primary organs and the general system. Goltz,² for instance, has shown that with the male frog it is not the testes, but the pressure of the seminal fluid in the receptacles that directly leads to copulation. The testes may be cut or taken out (of the brainless male animal) without lessening his grasp, while section of the receptacles has an immediate effect. If, however, they are now filled with milk or other fluid, the old stimulus is again exerted. When other organs are developed, such as the prostate gland, ejaculatory ducts, erectile muscles, clitoris, penis, and vagina, these come to occupy a similar position with regard to the general system. Castration, for example, does not always incapacitate for sexual union,

¹"The Functions and Diseases of the Reproductive Organs," p. 182.

²"Die Begattung des Fröches."

nor prevent masturbation. Ovariectomy does not always diminish sexual feeling. An inflammatory condition of the prostate is often the cause of sexual excitement, and of unduly frequent nocturnal emissions. Irritation of the glans, due to phimosis or other causes, sometimes precipitates the sexual orgasm. Excision of the clitoris is often successful in nymphomania.

The reflex connections of these organs, known to be situated in the lumbar region of the cord, must be connected with them as necessary to their functions, but while they are undoubtedly connected with the brain, nothing is known of the neural paths. That the brain acts as an inhibitory agent is shown by the erections and involuntary emissions following decapitation of criminals.

Beaunis¹ states that "Tarchanoff has seen stimulation of the corpora quadrigemina in the frog immediately stop the coupling. The optic thalami, according to the researches of Albertoni, have the same function in the tortoise." Jacobson² quotes Eckhardt to the effect that by electrical stimulation of the crura, pons and upper cervical region of the cord, distinct erection of the penis could be produced, and states that—

By other fibres the reflex act which constitutes erection may be inhibited from the brain. . . . While the influence of the brain in producing erection is evoked by sexual thoughts, or by sight, it is arrested or removed by vigorous mental employment or brain-work. The importance of the controlling fibres which run downwards from the brain is shown when these are interrupted by fracture or dislocation of the cervical cord. Priapism appears as soon as the effects of the concussion have passed away.

The sight, sound, odor, or merely the mental images of objects of desire are capable of producing sexual excitement. As Ribot says: "It is evident that impressions must reach the brain, since they are felt, and because there are centres from which the psychic incitations are transmitted to the sexual organs in order to arouse them into action."

It must be observed, too, that the accessory organs are sometimes quite remote from the primary glands, as in the male frog, where there is no intromittent organ, but where the arm and breast are highly sensitive to the shape of the female, easily distinguishing it from that of the male even when this is clothed in the skin of a female. The swollen thumb probably increases this sensitiveness in some way. The reflex apparatus is here lodged in the thoracic region.

¹ "Sensations Internes," p. 50.

² "Diseases of the Male Organs of Generation," p. 479.

Removal of the skin of the breast and arm stops copulation, even when removal of the head fails to effect this purpose.

The complexity of a number of different parts united by nervous paths to subserve one function and, therefore, practically to form one organ, allows of great plasticity in their use and development. Some part of the system may drop out without preventing the function of the rest. In dogs, for example, there are no vesiculæ seminales, which lack is the cause of their exceedingly prolonged coition. In man the corpus spongiosum may be useless without destroying pleasure or capacity. Closely allied species present the greatest variety in their sexual organs. Among species of the same genus, parthenogenesis may be the rule in one, sexual reproduction in the other. Darwin notes that "secondary sexual characteristics are essentially liable to vary both with animals in a state of nature and under domestication."

Plasticity is better marked in the more recent organs of the system. Diseases of the urethra, the prostate, and the functions of erection are more common than diseases of the primary glands, and when these are affected, it is frequently due to the initial failure of some other portion, as when irritable prostate causes too frequent emissions, ending finally in impotence. The nervous connections which determine the length of the orgasm and the succession of the functions constituting copulation are still more easily deranged, and most easily of all the associations in the brain represented psychologically by sexual images and desires. That these last are not simply necessary reflexes, but superadded organs and functions, is shown by their persistence after the primary organs have been destroyed. The most libidinous of men, also, are often those who are entirely impotent, as if the sexual erethism had concentrated itself entirely upon the organs that remain.

The separation of the sexes and the gradual dropping of parthenogenesis is one of the most important stadia in the progress of life. Either sexual or asexual generation may occur among the protozoans, coelenterates, worms, tunicates and arthropods, although it is only in some classes of the protozoans where sexual methods are not found at some period in the life of the species. The echinoderms, molluscs and vertebrata are always sexual. Hermaphroditism, where different sex organs occur on the same individual, is quite characteristic of primitive species. In many worms copulation occurs in pairs, when the male and female organs of each are brought reciprocally in contact, or in chains, when each

animal is in contact with two others, with the exception of those at the end. This exception is interesting as causing the inactivity of a male organ on one side and a female on the other, practically a monosexual arrangement and suggesting an evolutionary transition.

That the separation of the sexes always presupposes an underlying unity is indicated by many facts. The same organ in some species produces both eggs and spermatozoa, either at the same or at different times. Accidental or reversionary hermaphroditism, where one-half of the animal is male and the other female, the morphological correspondence of male and female organs, the male uterus, for example, are cases in point. In the frog, the testicles grow up round the ovaries, when if the sex is to be male the latter are absorbed. Even in the human embryo it is the sixth week before the sex can be distinguished.

As we ascend the animal scale, the reproductive instinct, although retaining its unity, becomes differentiated in two directions, primarily dependent upon the separation of the sexes and corresponding to their differences. On the one hand, the more anabolic, nutritive, feminine instinct of care for the young, on the other the katabolic, more erethic and masculine instinct of sex, originating in, radiating from, and culminating in the act of copulation. These two instincts mutually support and strengthen each other, and in man and the higher animals neither is complete without the full development of the other. They are both represented in either sex, although the sexual instinct is generally stronger in the male.

Radiation. The specialization of the sexual organs, as we have seen, is intimately connected with the development of the nervous system, and between this and the most recent or accessory of these organs, the bond of union, although not more fundamental and permeating, is yet more direct and close. As we ascend the animal scale, we find a number of organs more remotely but yet definitely connected with the reproductive functions, organs, to wit, of stimulation, prehension, and attraction, depending increasingly for their activity upon the higher senses and the brain, and giving rise to functions more distinctly psychological. In many cases portions of the body primarily developed for other purposes, such as hair, feathers, voice, etc., are turned to account in sexual stimulation and selection, and functions connected with the sexual life and developed under its influence may again become important in the immediate struggle for existence. Goltz, in his classic experiments on the frog, has shown that every part of the female exercises an attraction on the male, even little bits of flesh floating in the water.

"But," as Beaunis has it, "he was not able to determine by what sensitive avenue this attraction was exercised, since every organ of sense may be successively destroyed in different males without any of them ceasing to couple." Here, as elsewhere, the characteristic feature of sex is the law of irradiation, which might be stated as follows:

Starting from the act of copulation, the sexual instinct tends to widen and become more complicated, until the whole of the organism is involved in its activity.

This law is a necessary outcome of specialization and the erethism of sex. Sexual union is properly the climax of an erethism which involves the whole economy, but more especially those special organs of radiation, the brain and nervous system.

Many species quite low in the animal scale show traces of this feature. Annelids, snails, slugs, many crustaceans and insects betray unusual excitement at pairing times, and frequently possess "love-arrows" and other organs of stimulation not necessary to propagation, but serving to spread the erethism to the largest possible extent. In the higher animals sight and hearing, with their cerebral connections, take the place of other means of stimulation. With mammals the sense of smell occupies a position of importance, even in the highest species.

Selection. As the sexual instinct develops, concomitantly of course with the whole organism, the differentiation due to the separation of the sexes and the progress of irradiation becomes more apparent. Instead of a simple mutual approach, we find the male more generally seeking the female, fighting with other males for her possession, and actively displaying for her benefit his physical prowess and other charms. The differentiation of the sexual instinct, and its concentration in the male, itself tends to further radiation. Sexual selection now makes its appearance, and, according to either Wallace's or Darwin's theory, favors the descendants of those females which have the powers of comparison or observation, or whatever it may be, that leads them to choose, when they do so choose, the most capable, clever, and vigorous males. The direct rivalry of the males weeds out the inefficient, and here a relative tire or exhaustion of either the physical powers or the more psychical qualities of courage and endurance will have the same effect as complete defeat or death. Success is gained when the opposing male, for whatever reason, no longer feels like proposing. In relationship to the other motives of his being, the sexual instinct has been defeated. The relatively incapacitated male, even when he obtains a mate, will leave descendants less able in the struggle

for existence, and less likely themselves to continue their line of descent.

With the added inherited possibilities of irradiation and the increasing demands for higher physical and psychical qualities, the sexual instinct is thus being continually brought up to pass a new examination. When successful, it not only fills the old paths and satisfies their demands, but, true to its origin, carries the process still further on.

Combat. In the higher animals, the sub-departments of this examination are courting and combat, two divisions of the sexual instinct which mutually support each other, although one is often more predominant in a given species than the other, or may even obtain exclusive possession. But that one does not in most cases entirely supersede the other is shown by the fact that many birds and mammals continue courting after selection has been made. Those birds, *e. g.*, which are best provided with weapons of offense are also the most assiduous in courting. While stags are fighting, a doe will sometimes make her escape with another stag. The same is related of the capercailzie.¹ The fact, too, that so much of the combat is merely a harmless rivalry makes it difficult to say where combat ends and courting begins. At times they may even become identical. Both, at least, seem to go hand in hand, and demand the exercise of different sides of the nature of both the males and females.

The animal world is full of examples of the operation of these instincts. The males of spiders search eagerly for the females, and have been seen to fight for possession of them. When two male field-cricket are confined together, they fight till one is killed. The Chinese keep species of mantis in cages and watch them fight like game-cocks. Many beetles fight for possession of the females, and some, as the common stag beetle, are well provided for this purpose with great toothed mandibles, much larger than those of the females. The males of butterflies sometimes fight together in rivalry. Male sticklebacks fight furiously in presence of the females. They sometimes rip open their opponents with their lateral spines. "When a fish is conquered, his gallant bearing forsakes him; his gay colors fade away, and he hides in disgrace among his peaceable companions."² "The male salmon are constantly fighting and tearing each other on the spawning beds." The teeth differ with the sexes in many fish. Frogs have been observed fighting with much violence during the breeding season. Many lizards are very quarrelsome. The combats of a South American tree lizard usually end by the tail of the vanquished being eaten. "Almost all male birds are extremely pugnacious." The ruff fights much like a game-cock, seizing its opponent with the beak and striking with the wings. The great ruff of feathers is erected and serves as a shield. Bloody fights occur between the

¹Darwin.

²Darwin, "Descent of Man."

males of the wild musk duck. Male snipe fight together, and the males of the common water hen fight violently for the female who looks on quietly. Peacocks sometimes engage in fierce conflicts. The black cock, capercaillie and many species of grouse and pheasant fight desperately at times. The game-cock has been known to fight when its legs were broken and afterwards spliced in order to enable it to stand until it received its death stroke. A few birds are believed never to fight, as with the woodpeckers, although the hens are followed by half a dozen suitors.¹

The fighting instinct, too, underlies a great deal, if not all, of rivalry and courting.

"A sterile hybrid canary bird has been described as singing while viewing itself in a mirror, and then dashing at its own image. It attacked with fury a female canary put in the same cage."² This also shows the capacity of the secondary function to become dissociated. Male birds give plenty of evidence of jealousy of each other's singing. Chaffinches are habitually caught by playing on this instinct. The domestic cock crows after victory and "the humming-bird chirps in triumph over a defeated rival."³

Combat is of great importance among the mammals. Male hares, moles, squirrels, beavers, quanaoos, deer, and other timid animals often fight desperately during the love season. The canine teeth, as with "some antelopes, the musk-deer, camel, horse, boar, various apes, seals and the walrus," and horns, spurs and manes are specially developed for the purpose of combat. The pitched battles of stags are well known, and frequently end in death.

*Courting.*⁴ The courting instinct, although the earliest forms are known among some of the most primitive species, appears to be somewhat more remote from the primary functions and more complexly associated than the instinct of combat considered by itself. There are many instances that make it appear that combat, or the passions based on combat,—anger, jealousy and fear—are very frequently submerged elements in the courting instinct. Courting may be looked upon as a refined and delicate form of combat, which latter may nevertheless often be appealed to as a last resort. The play upon the appreciation of the higher senses and intelligence which constitutes courting tends to become continually more remote from physical combat. And even where physical combat exists, it may really form an element in the courting instinct. It would be very difficult to prove that the real fights ending even in bloodshed do not have a stimulating and pleasing effect upon the female, and in many cases combat appears to degenerate into a mock battle, where the opposing male is

¹Darwin, *op. cit.*, pp. 260-368.

²Darwin, *op. cit.*

³Darwin, *op. cit.*

⁴Cf. Tillier, "L'Instinct Sexuel."

either daunted and discouraged or the female influenced in her choice. In both cases the psychical equipment would be of a higher order. Combat by itself does not presuppose nor require any remarkable psychic effect of one sex on the other. Courting, even when resting entirely upon the male, presupposes appreciation or at least some effect of a psychical nature upon the female. The progress of evolution appears to show a movement towards the more irradiated and secondary although no less erethic instinct of courting.

Male bees, wasps, butterflies and moths are generally brighter colored, plainly for the purposes of courtship. In some insects, as with the glow worm, the male alone is provided with wings, and there is generally a superfluity of males, facts which induce either combat or courting. In many of the coleoptera the sexes differ in color, so much that they have sometimes been classified as different species, and they are often provided with protuberances which serve as ornaments.

Among fishes there are many instances of courtship and display. The Chinese macropus expand their fins, which are spotted and ornamented with brightly colored rays.¹ The splendid colors of the peacock labrus, in one species of the genus at least, differ greatly according to sex. In two species of ophidium the "males alone are provided with sound-producing apparatus."

Among frogs and toads it is principally the male which croaks. Sometimes they alone are provided with resonant sacs. The male alligator strives to win the female by splashing and roaring. "Swollen to an extent ready to burst, with head and tail lifted up, he spins or twirls round on the surface of the water, like an Indian chief rehearsing his feats of war."

Male snakes can generally be distinguished from females by their stronger colors. Male snakes are provided with anal scent-glands, which as the males follow the females, Darwin thinks, probably serve to excite or charm. The rattle of the rattle-snakes is used as a sexual call. The crest of many lizards is much more developed in the male than in the female. In the genus *satanas* the males alone are furnished with a large throat-pouch, which can be folded up like a fan, and is colored blue, black and red; their splendid colors are exhibited only during the pairing season. The changing colors of the chameleon show the increased excitement of the male during the pairing season.

In birds the courting instinct is very well developed, giving distinct and wonderful examples of appeal to the higher senses

¹Darwin, *op. cit.*

of sight and hearing, and rising beyond the passive pleasure of these senses to a most complex association of sound, sight and movement in their stated dances and parades. Because of the direct appeal to the senses as distinguished from the more irradiated powers of sensibility in general, the courting instinct is more decidedly in evidence among the birds than with the mammals, although it may very well be true, as is indicated by their more permanent affections, that the mammals have a more inner and heartfelt ecstasy, and that their display and appreciation are not so prominent, simply because they are more rapid, deeper, and more penetrating. The wonderful way in which dogs are able to divine their master's meaning, judging from the slightest indication of eye or hand, shows the unobtrusiveness, but no less the effectiveness of their sensibility.

Male birds "are ornamented by all sorts of combs, wattles, protuberances, horns, air-distended sacs, top-knots, naked shafts, plumes and lengthened feathers gracefully springing from all parts of the body." The beak and sometimes the iris of the eye are more brightly colored in the male. The fleshy appendages about the head of the male Trapogan pheasant swell into a large lappet on the throat and outer two horns, which become colored a most intense blue. The African hornbill inflates a scarlet wattle on its neck. The wattles of the turkey cock swell and assume vivid tints while courting. The immense variety and wealth of form and color in the feathers of birds are too extensive and too well known to admit of much detail. The greenfinch, sparrow, magpie, stocking-weaver, heath-lark, mocking-bird, falcon, Virginian night-hawk, stone-smacker, blackhead, tufted titmouse, golden pheasant, cock of the rock, bower-bird, and many others have often been cited in evidence of the ecstatic movements and brilliant displays of birds during periods of sexual excitement. Many species of the gallinaceæ give good instances of the power of the courting instinct and the way in which it is related to combat and ecstasy generally.

In the case of the woodgrouse¹ the hens are less watchful than the cocks (because they are spared by the huntsmen), and become quite tame at pairing time. The cock the whole year round is very quarrelsome and is always fighting with those of his own sex, and is very imperious and violent even with the hens. The more amorously he has demeaned himself at pairing time, the more indifferent he becomes afterwards to his mate. Sometimes he falls upon her and injures her without any apparent reason.

The woodgrouse begins to "balz" in the earliest spring, when as yet everything is quiet in the woods. The cocks, who have formerly been isolated, collect themselves upon a certain place, generally a

¹Brehm, "Thierleben," Band 6, p. 33.

southern slope grown over with underbrush. The hens also in the neighborhood come for the purpose of attending these amorous plays and of obtaining a mate. Both sexes come about seven in the evening, silently except for the whirr, and light upon isolated trees. After the cock has alighted he remains for some moments perfectly motionless, observing everything with the greatest attention, at which time the smallest noise which appears suspicious will cause him to fly off again. If everything is still, he gives a sound something like the grunt of a young pig, which is taken as a sign of good weather by huntsmen, as the balzing will then likely take place in the morning. Sometimes, however, it happens that the cock begins to balz, immediately descends to the ground, struts before the hens found in the vicinity, and ends by covering them. Ordinarily, however, the balzing begins not before the first streak of dawn, *i. e.*, about three o'clock. When the balzing begins, the head is stretched out, the wings somewhat held down and out from the body and the tail raised. During the "rattle" (of the song) the cock customarily runs along the branch on which he is perched; during the "slurring" he bristles up his feathers and twists himself around. But this order is not always followed. There is considerable variation of the "rattle," the "slur" and the "head note," the same cock sometimes changing from one way to the other in the same morning. The first note begins "töd," then follows töd, töd, töd, töd, and finally becoming quicker, töd, öd, öd, öd, öd, until the "head note" "gluck" is uttered, which is stronger than the rest. Then begins the slur. This "slur" lasts $3\frac{1}{2}$ or 4 seconds. Exceptionally some cease with the "rattle" before the "top note," others after it, and others in the middle of the "slur." Every new "slur" excites the bird more and more. He goes up and down the branch, lets his excrement fall plentifully, grasps in the air with one or the other claw, springs from one branch to the other, or "*steht nach kurz*," as the hunter says, and finds himself in a kind of ecstasy, in which everything around him is forgotten. This goes so far that the report of a firearm does not trouble him even at short range. At the "slurring" all woodgrouse are very hard of hearing, but it is somewhat otherwise with sight. The spark of the firearm alarms him. A white handkerchief waved under him causes him to cease in the middle of the "slur" (which seems to be the most ecstatic part). Brehm believes this comparative blindness and deafness are due to the excessive "heat" or sensuousness which moves the bird at this time. When the bird "sings" in captivity, it is observed that during the "slurring," the head and neck are stretched out and the nictitating membrane is half-drawn over the eyes. There is some proof that the birds really hear, but do not regard, *e. g.*, a case where the bird turned his head when a gun went off, but did not cease the ecstatic slur. The birds, too, are very fearless during this whole period, and will run out at men and horses sometimes. When the hand is brought before the bird even in the middle of the "slur," he pecks at it. An old cock will not allow any young one nearer than a circle of about three hundred paces, and fights with any opponent; not unfrequently one or the other is killed. Geyn says young cocks crow very lightly in the neighborhood of an old strong hero of the lists.

The climax of the balzing is just before the sun rises. When there is a moon, the balzing is more vigorous. After the day has fully broken, the cock ceases and joins himself to the hens, which are to be found a short distance around. At times it happens that a female draws near to the balzing cock and invites him with a tender "bak" "bak" to herself. He cannot resist this an instant; he falls

like a stone from the tree, and dances in a wonderful manner upon the ground. Customarily, however, he must seek out the hens and not seldom flies a considerable distance around after them. Once near the hen he balzes and dances, finally covering her as she is cowered upon the ground. How many hens he is capable of covering in a morning is not known, as a cock seldom has more than three or four hens. The hens appear to have more inclination to some cocks than to others, which occasions severe fighting, in presence of the hens and on the ground. In the third or fourth week of the balzing the cocks leave the balzing place and go back to their often distant feeding places, and the hens begin to build their nests in separate places. When food is plentiful in the fall, the cocks go together in troops.

Courting and combat may both become dissociated somewhat from copulation, a fact which harmonizes with the increasing complication and plasticity of the higher functions of the sexual system. Many male animals fight whenever they meet, although their conflicts are more intense at the breeding periods. Pouters are trained to show at the sound of the owner's voice. A cock and a hen are placed in boxes with a partition between. The owner approaches, makes a peculiar call, and raises the partition. "The birds generally put themselves into the best and most striking attitudes. They soon come to associate the sound of the owner's voice with the expectation of seeing their mates, and will begin to fill their globes and strut about with delight." Later on the voice is all that is required.¹

Mr. Hudson² gives us among others the following case of evident dissociation. From the point of view of art, it is interesting to observe that this occurs when the irradiation has become highly complicated and therefore more readily plastic and controllable.

A strange performance is that of the spur-winged lapwing of the same region, which occurs at frequent intervals, especially on moonlight nights, all the year round. These birds live in pairs, but one of a pair, leaving his mate to guard the nest, will rise up and fly to a neighboring couple, where it is welcomed with notes and signs of pleasure. Advancing to the visitor, the receiving couple place themselves behind it. Then all three, keeping step, begin a rapid march, uttering resonant drumming notes in time with their movements, the notes of the pair behind being emitted in a stream like a drum roll, while the leader utters loud single notes at regular intervals. The march ceases; the leader elevates his wings and stands erect and motionless, still uttering loud notes; while the other two, with puffed out plumage and standing exactly abreast, stoop forward and downward until the tips of their beaks touch the ground, and sinking their rhythmical voices to a murmur remain for some time in this posture. The performance is then over, and the

¹ Robert Fulton, "Illustrated Book of Pigeons," p. 126.

² "Music and Drama in Nature," *Longman's Magazine*, 1890, Vol. XV.

visitor goes back to his own ground and mate to receive a visitor himself later on.

As we have already noticed, combat is the leading feature of sexual selection that can be readily observed among the greater part of the mammals. To the result of this, however, the female must lend her sanction, and must herself be willing in the most of cases to belong to the conqueror of the lists. When she is not, combat and possession are of no avail. A female could easily avoid union by flight or go off with another male if she so desired, as, indeed, sometimes occurs. The male is frequently in heat when the female is not, and her refusal is then always effectual. The males of dogs are ready for copulation at all times, but union never occurs until the females are themselves in heat.

It seems difficult to tell what the characters are that influence the female mammal in her choice. In contrast with the birds, they are not characteristics which immediately appeal to the outer sensibility. They seem to depend rather on some sort of interpretation of the sensuous impressions and appeal rather to the higher capacities of the brain. Cases, however, are not wanting where characteristics are developed which appear to be of service as sexual charms. Odors, as already mentioned, are of great importance among the mammals. "Large and complex glands furnished with muscles for uniting the sac and for closing and opening the orifice have in some cases been developed." The males of certain antelopes are provided with erectile ridges of hair running along the back, which can hardly be of service as a defense in battle. Many species of quadrumana have very ornamental hairy crests upon the head. The beards of goat and ibex and the whiskers and beards of many monkeys are confined to the males. Many male deer are considerably different in color and possess brighter markings than the females. The young approach the female color, and castration frequently prevents the development of the special characteristic. The voice of the male is generally stronger, and sometimes special sacs are developed which increase the sound, as with some species of deer. With the quadrumana, although the sexes generally resemble each other, there are so many odd and curious variations of form and color that it is difficult to believe they are not serviceable as sexual lures.

As we have seen, the phenomena of courting are exceedingly complicated. On the part of the female, definite courting appears to assume two contradictory impulses, to receive the male and to repulse him. Espinas¹ explains the refusal as a length-

¹ "Die Thierischen Gesellschaften," p. 267 and ff.

ening out of the pleasure on her part. "The following of the males, says he, must awaken in the females a more or less definite image of sexual union." "This pursuing of the males is also in itself a pleasure, and there is no lack of examples in the animal kingdom where a satisfaction is intentionally protracted or put off in order to extend the enjoyment * * *. So the cat plays with the mouse, the otter and cormorant with the fish * * *. For the same reason the females must put off the males because they feel the pleasure of being sought, and are able to wish for the lengthening of this pleasure."

But there are many cases which show that the female is really moved by an underlying timidity, fear, or even dislike, instead of a desire for pleasure in thus lengthening courting. Very often the female heat is some days or hours later than that of the male. His excitement, expressed in movements of various kinds, is naturally communicable, especially in the higher animals, and the erethism thus flows over from the male to the female. Or, in other words, the instinct of fear and dislike is overcome by love. While males are fighting or displaying their ornaments, the females frequently look on quite unmoved, as with the females of black cock, who walk off into the underbrush, where they have afterwards to be hunted up by the male. Darwin observes that in many cases appearances would lead us to believe that the female selects "not the male which is the most attractive to her, but the one which is the least distasteful." Courting is often continued after all rivalry has ceased, and appears in many cases to help overcome the natural passivity of the female, as we saw with the capercaillie, who runs out from her cover to meet the male.

Fear and Anger. There is, however, more than the demand of the female which leads to courting. If the higher forms of courting are based on combat, as we have already suggested, among the males, at least, anger must be intimately associated with love. And below both of these lies the possibility of fear. In combat the animal is defeated who is first afraid. Competitive exhibition of prowess will inspire the less able birds with a deterring fear. Young grouse and woodcock do not enter the lists with the older birds, and sing very quietly. It is the same with the very oldest birds. Audubon says that the old maids and bachelors of the Canada goose move off by themselves during the courting of the younger birds. In order to success in love, fear must be overcome in the male as well as in the female. Courage is the essential male virtue, love is its outcome and reward. The strutting, crowing, dancing, and singing of male birds and the preliminary

movements generally of animals must gorge the neuro-motor and muscular system with blood, and put them in better fighting trim. The effect of this upon the feelings of the animal himself must be very great. Hereditary tendencies swell his heart. He has "the joy that warriors feel." He becomes regardless of danger, and sometimes almost oblivious of his surroundings. This intense passionateness must react powerfully on the whole system, and more particularly on those parts which are capable, such as the brain,¹ of using up a great surplus of blood, and on the naturally erethic functions of sex. The flood of anger or fighting instinct is drained off by the sexual desires, the antipathy of the female is overcome, and sexual union successfully ensues.

Some animals even seem to play upon this fighting instinct. Darwin mentions the case of a female of the cape buffalo fighting with the male. They pushed each other about quite violently. He observes, however, that the bull never used his horns in a serious way, and could easily have ended the fight if he had so desired.

In their general relationships, the anger-fears and sex seem each to be large systems of overt or partially inhibited reactions, connected with each other much in the same way in which Fig. 2 represents the reciprocal reaction of r and r^1 . Within the limits of this article, it is of course not our intention to study the anger-fears in detail, nor to show their equivalence and interdependence with sex, except when and in so far as they are subordinate, and aid in the discharge of the sexual functions.

Sex and Care for Young. Although the function of reproduction is the starting point of both the sexual instinct and the instinct of care for the young, and although the latter of these has added immensely to the complexity of life and to its higher psychological processes, it seems to be somewhat late in the series before these two great instincts can be said to be distinctly connected. The care that many animals exhibit for the product of impregnation does not appear to grow directly from the desire for copulation, and it would be presuming extraordinarily upon the representative powers of the lower animals if we should say that the desire for offspring determined that for copulation. It seems more probable that care for the young grows out of the care of the individual for its own body, and that the offspring, which has been for a time a portion of herself, is defended by the

¹ This would obtain even although the cubic contents of the skull are unchanging—rapidity of circulation taking the place of an accumulation of blood. Cf. Bayliss and Hill on "Cerebral Circulation," *Jour. of Physiology*, Sept., 1895.

mother with a fervor which arises almost directly from the instinct of self-preservation. Natural selection would operate favorably on any such attachment, both on account of the preservation of the offspring and the reaction on the parent, in whom becomes cultivated an experience of wider relationships and a better power of dealing with her environment. The mother that so extends herself to her offspring that she sees for it, hears for it, and provides for it in many ways, becomes herself more highly developed. The parallel development of organs capable of retaining and nourishing the impregnated egg, although they do not appear themselves to be dependent upon the motherly instinct, yet by producing offspring which is larger and more perfect, both add strength to the original feeling of bodily identity and provide a further appeal to the instinct based upon it. Where the instinct of care for the young affects the father also, or devolves entirely upon him, the source of the instinct must lie in another quarter.

Let us take an example. The male stickleback, whose very violent combats have already been noticed, builds for the female a nest, in some species made of agglutinated sticks, a burrow of stones in others, both of which serve to accumulate the eggs, which are fertilized by the attendant male. After the eggs are fertilized, however, the male continues to watch over them until they are hatched and the young grow of a certain size. His pugnacity serves him in good stead, and enables him to defend the nest against marauders, none of whom are more troublesome than the female stickleback herself, who would readily eat her offspring unless driven off fiercely by the male. How is it possible that the instinct should be developed?

In the first place, as Espinas notes, the eggs of fish must generally be fertilized within five minutes of their emission—otherwise they die. Hence the male fish follow closely upon the issuing ova, which must be frequently in his field of vision, and become an object of attention and regard. That this is so of some fish is shown by the Chinese macropus. "After the male has won his bride, he makes a little disc of froth by blowing air and mucus out of his month," into which he collects the fertilized ova, guards them and takes care of the young when hatched.¹ When the courting of the male has influenced the female stickleback to enter the nest built for her, it is not unnatural that his attention will become directed to the eggs. Indeed, it would appear that this may always be an element, as fish are gen-

¹Darwin, *op. cit.*

erally ready to eat the eggs and young of other species. The desire must, therefore, be inhibited in the males at the spawning times, at least as far as eggs issuing from the female are concerned. Such a regard for the eggs, handed down for generations, and favored as it would be favored powerfully by natural selection, might very readily issue in the instinct of the stickleback.

It would appear that in this case the instinct of care for the young has grown directly out of the sexual instinct, and may be regarded as an irradiation of it. The percepts necessarily associated with the acts of fertilization, have become the basis of a care which continues after the acts of fertilization themselves have ceased. The instinct of the midwife frog already referred to may have originated in a similar way. With the female of the Surinam toad, who carries her young on her back, the instinct probably originated with the male, since it is he who takes the fertilized eggs and places them in the dorsal pouches, where they hatch. If this action of the male originates as an irradiation of the sexual instinct, the further irradiation to the female is of considerable interest. The habit of the male ostrich, who collects the eggs laid by the female and hatches them entirely by himself, would not seem to be directly connected with the sexual instinct, as these acts are not associated with copulation. They might rather be residua or survivals of a time when both sexes sat upon the eggs, as is customary with many birds. It is possible, however, that this habit itself (of the males helping the females with the care of the eggs and young) may be a sexual irradiation. The instinct having been already established on the part of the female, and when the natural irradiation of the sexual passion in the male has led to the repetition of sexual acts with the same female and the association of impulse and impressions which results in pairing for however short a time, this interest in the female might very readily be extended to the offspring which belongs to her, and which she is so ready to provide for and protect. Espinas notes that among birds it is precisely the least intelligent which abandon the female after copulation. To this they are led, he thinks, by the unassuaged ardor of their passions, and by the fact that they have not been able in the "time too short of a brutal pursuit" to impress the image of the female sufficiently deep to be a means of attachment.

The paternal instinct would not, then, be at the bottom, care for the young, but an irradiation of the characteristically male instinct of sex, through the female to the young themselves. This, however, would generally occur only when development had proceeded to a considerable extent, and

comparatively late in the phylogenetic series, a fact with regard to the paternal instinct which has been frequently recognized. Cases like that of the stickleback or Surinam toad are exceedingly rare, and it is not until we reach the birds and mammals that we have any well marked instinct of care for the young, and in these classes the female undoubtedly leads. Indeed, among many quite highly developed species, as with the capercailzie, the males take no part in guarding the nest or rearing the young. With the paternal instinct, when it has really come in, as with undoubted sexual characteristics generally, there seems to be a great deal of variety and plasticity. In certain species the male may play a very considerable rôle, while in closely related forms he takes no part whatever. Species of grouse, which sometimes cross with the capercailzie, assist the hens in the protection and rearing of the young. The lion trains his pups, while the tiger is said to be eager to destroy them.

In polygamous or gregarious species, the males will easily come to associate the already considerable number of females with the additional young ones, and to extend the interest and protection which he originally owes to his wives to their offspring also. Bulls among wild cattle form a ring with the females and the young in the centre when danger threatens. Stallions do the same. Boars in India defend the herd against leopards and other animals except tigers. Stags protect their families from other animals as well as from males of their own species. With the llamas¹ each troop is composed of one male, with several females and their young. The male grazes at some distance from the flock, and is continuously on the watch. When danger threatens, he issues a warning cry, all the heads are raised, and when there is necessity the herd takes to flight. The females and young go before. The male follows them and often pushes them with his head. If the male is wounded or killed, the females run round him, making a whistling noise, and allow themselves to be killed rather than flee. If a female is killed the herd does not stop.

With many monkeys the strongest male becomes the guide and protector of the band. He demands absolute obedience and enforces it under all circumstances. His subjects are always ready to pay court to him, and apply themselves with the greatest zeal to freeing his hair of troublesome parasites, to which operation he lends himself with a grotesque majesty. In return he watches faithfully over the common safety. He is always the most circumspect. His eyes wander constantly

¹ Brehm, *op. cit.*

from one side to the other. He distrusts everything, and he nearly always succeeds in discovering in time the danger which threatens the troop. Darwin quotes the instance of a band of baboons who had been surrounded by dogs, and who had with difficulty made their escape, "excepting a young one about six months old, who, loudly calling for aid, climbed on a block of rock and was surrounded. Now one of the largest males, a true hero, came down again from the mountain, slowly went to the young one, coaxed him, and triumphantly led him away — the dogs being too much astonished to make an attack." In these cases the male is very jealous and drives away all other males when they arrive at maturity. His care for the young seems to be founded upon his desire for the continuous possession of the female, and is thus certainly an irradiation of the sexual instinct. It is very interesting that in some cases this accessory instinct should be more effective in the protection of the young than the instinct of maternity itself. While the care for the young on the part of the male is, in many cases, a derivation of the sexual passion, this does not hold true of the female, nor is there a reciprocal radiation, except perhaps in man, which places the maternal instinct at the basis, making the desire for offspring lead to a desire for sexual union. On the contrary, in both sexes the desire for union is primordial, and in the male, if the present view is correct, it is also basal, while in the female, care for the young is derived from the love of her own body and is much more independent of the sexual passion.

The Æsthetic Capacity. Whatever variety of different passions play together in composing the final erethic movement of sex, no one can read of the operation of the sexual instinct in the lower animals without being struck with the wealth and abundance of the striking, the attractive, and the beautiful, with which this instinct is closely connected.

Whether these have been wholly produced by gradual selection on the part of the females or not is not necessary to our purpose. There may very probably have been many different agencies at work. The different physiological constitution of the sexes would result naturally in a predominance of bright colors (due primarily to overabundant waste products) and of more energetic movements. It seems, too, very possible, as Wallace supposes, that natural selection would operate in cutting off the less active females of brighter color, while the males would be able to save themselves, and thus propagate their kind. But with the development of the higher senses and the brain, it would seem very unnatural indeed, if the female should not be closely attentive and deeply moved by the caresses, the showy movements, the

gorgeous colors, and the singing of her mate, and that special excellence in their qualities would not have the effect of charming and attracting her and of overcoming her objections to the sexual act.

It has been supposed by some that the bright colors of the males have originated as signs of recognition and that to this they still owe their great variety in closely allied species. But it would seem that animals, as highly developed as the birds and mammals, are capable of recognizing very fine points of difference, especially when the objects concerned are part of their customary experience. Most game birds know very quickly the difference between a man with a gun and a man without. Young chickens make no mistake about seeds found in sand of a very similar appearance. A ram distinguishes another ram immediately from a ewe even in hornless varieties. Wild boars give a different sign to the herd on the approach of a leopard, from that given when a tiger is noticed.

In many cases, too, it is not the parts of the body most easily seen which are the most striking or beautiful. A great many birds are quite dull on the back, but have beautiful markings on the under surface of the breast and wings, as with our common nighthawk. The beautiful ball and socket designs on the under surface of the wing of the male Argus pheasant are only displayed when the bird purposely holds up his wings, which he does when courting, and so on in numberless cases, some of which have been already referred to. There must be a great deal more at work than the necessity the sexes are under of distinguishing each other at a distance. For this, much slighter modifications would suffice, and any increase beyond the minimum would be dangerous in the struggle for existence. It may very well be, however, that in earlier times and yet among more primitive species, a slight difference would be of advantage in enabling the sexes to find each other. If even a small per cent. were more successful on this account, it would tend to perpetuate the characteristic. It has been noticed by many authors in this connection that singing birds are found more frequently in thickly wooded countries and are not brightly colored, while the birds of brilliant plumage are found where they are able to be seen at a considerable distance.

It is to be noticed, also, that bright colors and energetic movements are a sign of health and vigor, and on this account their selection by the female would benefit the species and thus tend to its expansion and survival. This may very well be the *meaning* of these love displays, but we can hardly suppose that the female is capable of such powers of repre-

sentation as to enable her to understand this relationship. When she chooses, it is not because she realizes that her mate is the most vigorous, but simply that he is the most pleasing. In brightly colored species, *e. g.*, it will be the sign and not the thing signified which occupies her attention. Indeed, it will not be a sign to her at all, but simply the stimulus of pleasure and delight. Even with the mammals, with their greater capacity of interpretation, and their advance beyond the simple appeal to the outer sensibility of eye or ear, and although their movements in courting and combat are more directly the expression of health and vigor, it is surely not willingly on this account that the female exercises her choice. These movements must appeal to her simply on æsthetic grounds. They are directly felt to be pleasing and attractive. Even among mankind the countless impressions with which we are surrounded, crowded with meaning as they are, are nevertheless much more frequently taken simply for themselves than for the meaning which lies behind them. That we are pleased by a certain act is sufficient. It is only rarely that we desire to know its full significance. No doubt that in the operation of natural selection, mankind, as well as the animals, attach the greatest importance to events which are significant of others directly bearing on their welfare. But this significance is felt and acted upon long before it is measured. There even comes to be a sense of significance when that significance remains unknown, a repulsion, or a delight, in that which seems to have some deep and everlasting meaning, and which doubtless has it, however distant it may be from the consciousness of the individual at the time. The countless manifestations of beauty may very readily be signs of something more, but there is no evidence which shows that, with the exception of man, these are ever valued in such a way. The process of nature is much more simple, and rests upon sensuous perception, and the feeling of attraction or dislike arising directly from it. According to this view, however, the appreciation of the beautiful and the reality which lies behind it go hand in hand. "What, indeed, is beauty," says Espinas, "if it is not organization become sensible, life become manifest?"

In the appreciation of the beautiful as thus understood, we must not suppose that the female alone is interested and that the male confines himself to its production, and to the effect of this upon the female. The males are exceedingly sensitive, perhaps more so than the females, to the prowess of other males. The young cocks of many grouse keep at a distance when they hear an older and stronger cock. The young nightingales are not able to sing well the first season, and

gradually learn the accomplishment from the older birds. The males of passerine birds arrive at the nesting places often days in advance of the females, but sing, nevertheless, with great zeal. With the gallinaceæ, generally the singing and display are carried on among the cocks themselves, and when the females are at a distance. This display, as we have already suggested, probably has the effect of daunting other birds as well as warming up individual courage. A slight increase of color or size of feather, or more energetic movements, would be very easily associated with a sense of mastery, and the animal who appreciates this more readily saves himself from defeat, and possibly finds another mate, by whom he sends down his greater sensitiveness to the next generation. He has at least a second chance in the struggle for a mate.

It seems, then, quite possible that selection among the males themselves may lead to an increase of beauty, and even to the appreciation of it on their part. That this beauty is feared rather than loved is at least nothing against its power of fascination, and its really being recognized as beautiful. The charm that serpents exercise on some birds, and the possibility of charming snakes themselves, show the capacity of this kind of fatal fascination. Early races were in the habit of wearing, not ugly, but often beautiful things, for the purpose of striking terror into the hearts of their enemies. The nodding plumes of the Greeks and even the military costumes of the present time are cases in point.

But whatever the agencies at work, the primary relation is clear. The sexual instinct in its irradiation upward and through its increasing dominion over the higher senses and the brain, has given rise to a distinctly æsthetic capacity, capable of appreciating the beauty of form, color, movement, and sound, issuing in whatever way from the bosom of life and expressive of its sweetest harmonies as well as of its depth and power.

Courting Instinct in the Lower Races. The study of the sexual instinct in early man is somewhat difficult of approach. We are cut off from any direct observation, and the historical remains of even the oldest races do not begin to go back to the savage state. The study of the lower races of the present time is certainly instructive, but one is liable to be misled by the fact that these races do not stand in the line of progress, and in some cases are distinctly degenerate types. The light thrown upon early times by archæological remains and by the survival and transmission of ancient rites and customs, reveals an abundance of material suggestive indeed, but

equally difficult to interpret. Between the highest of the apes and our earliest knowledge of man there lies a gap, no wider perhaps than between many other species, but in which we have a more than ordinary interest. As to sexual characteristics, there have come in some important modifications. The periodic breeding season, with the exception of slight traces, has disappeared, and sexual union is possible throughout the year. This physiological fact has decreased the periodic intensity of the sexual passion and placed it more under the control of the higher intellectual and emotional powers. That domestic confinement has the same effect on the apes and on some of the lower animals shows this to be connected, probably in a reciprocal manner, with the advancing social condition. The same thing is shown by the statistics of births, where the increase of conceptions in April and May is found to be greater in the country than in the city.¹ The more secondary sexual characteristics have also changed considerably. The difference between man and woman is said to be greater than between the sexes of most of the quadrumana. In the later maturity of the male, his greater size, larger brain (absolutely) and greater sensitiveness, strength and courage, stronger voice, greater prominence of the superciliary ridge, and sometimes of the sagittal crest, greater hairiness and better developed beard—generally of a lighter tint than the rest of the hair,—man differs from woman in the same way that the male of the quadrumana differs from the female. The secondary sexual characteristics vary greatly with different races. Flat and hooked noses, broad and long faces, high, receding, or broad foreheads, well rounded occiputs, black, red, yellow, and white skins, long or abundant hair, or none at all, leanness, fatness, squinting eyes, enormous ears, protruding buttocks, and breasts long enough to throw over the shoulder, are natural features found in various quarters of the globe, and where they exist are esteemed as beautiful, are preserved by sexual selection, and often enhanced by artificial means.

The courting of the lower races has in it, to our eyes, very little of either love or beauty, but it is very different to the savages themselves. Their rude dances, their tattooing, their ornaments, the display of their persons and their clothing are to them a matter of much importance.

Most savage men² take pride in the hair of the head. Now it is painted in a showy manner, now decorated with beads and tinsel, now combed and arranged with the most exquisite care. The Kandhe have their hair, which is worn very long, drawn forward

¹Westermarck, "Human Marriage," p. 69.

²Westermarck, *op. cit.*

and rolled up till it looks like a horn projecting from between the eyes. Around this it is their delight to wear a piece of red cloth, and they insert the feathers of favorite birds, as also a pipe, comb, etc. The men of Tana of the New Hebrides wear their hair twelve and eighteen inches long, and have it divided into some 600 or 700 little locks or tresses, and among the Satuka a man requires a period of from eight to ten years to perfect his coiffure. Tuckey states that on the Congo both men and women shave the head in ornamental figures.

Among the Set-has in Indo-China it is the unmarried youths that are profusely bedecked with red and white bead necklaces, wild boar tusks, brass armlets, and a broad band of black braid below the knee. Speaking of the Encounter Bay tribe of South Australia, the Rev. A. Meyer says "that the plucking out of the beard and anointing with grease and ochre (which belong to the initiatory ceremony) the men may continue, if they please, till about forty years of age, for they consider it ornamental, and fancy that it makes them look younger and gives them an importance in the eyes of the women." "In Fiji," says Wm. Anderson, "the men who like to attract the attention of the opposite sex don their best plumage, and when Wm. Bulmer once asked an Australian native why he wore his adornments, the native answered that he wore them in order to look well and to make himself agreeable to the women."

But although these outward adornments, in the lowest races at least, are probably more frequent with the men, it is not long before the women are equally anxious to add to their natural charms. Baneroff tells us that young Kadiash wives "secure the affectionate admiration of their husbands by tattooing the breast and adorning the face with black lines," and in another place that the Nahuas women used paint freely to beautify their persons. "Among the Aztecs, they painted their faces with red, yellow or black color." They also dyed their feet black. Hands, neck and breast were painted, and their teeth were cleaned and painted with cochineal. The Nahuas also had a passion for loading themselves with ornaments, the more valuable being legally restricted to the better classes of society.

"Among the Makalolo the upper lip is perforated and a large metal and bamboo ring called a *pelelé* is worn in the hole. This caused the lip, in one case, to project two inches beyond the tip of the nose, and when the lady smiled the contraction of the muscles elevated it over the eyes. 'Why do the women wear these things?' the venerable chief Chinsurdi was asked. Evidently surprised at such a stupid question, he replied, 'For beauty! They are the only beautiful thing women have; men have beards, women have none. What kind of a person would she be without the *pelelé*? She would not be a woman at all with a mouth like a man, but no beard.'"¹

¹Livingstone quoted by Darwin.

It would go beyond our space to describe the different methods savage races have adopted in order to beautify their persons. Teeth are knocked out or filed like saws, the head is shaved, hairs plucked out, eyebrows shaved and eyelashes pulled out, the skull is compressed, feet are squeezed and lengthened, or shortened by doubling up the four smaller toes, ears, noses, lips are loaded with rings and daggers, ear-lobes are dragged down until they approach the shoulder, breasts are cut off or made to project unnaturally, warts, scars and ridges are raised upon the skin, which is also painted, dyed or tattooed. Modifications of the sexual organs themselves are frequent and remarkably persistent among the habits of the tribe. Common practices are those of infibulation and circumcision. The nymphæ and clitoris are lengthened, the glans penis is pierced by needles and provided with ampullæ, artificial hypospadias are produced,¹ the penis is split or covered with hairs, prickles or other instruments. There seems, indeed, to be no part of the body free from some attempt at improvement.

Tattooing, which generally takes place at puberty, is a very chosen form of mutilation, and sometimes gives rise to a quaintness or beauty of design pleasing to any eye.

In Samoa, until a young man is tattooed he could not think of marriage, but as soon as this was done he considered himself entitled to all the privileges of mature years. "When it is all over," says Mr. Pritchard, "and the youth thoroughly healed, a grand dance is got up on the first available pretext to display the tattooing, when the admiration of the fair sex is unsparingly bestowed. And this is the great reward, long and anxiously looked forward to by the youths, as they smart under the hands of the matai * * *." When Merteus asked the natives of Sukunor what was the meaning of tattooing, one of them answered, "It has the same object as your clothes—that is, to please the women." Bock remarks, as the Wyak women are tattooed to please their lovers, so the Laos men undergo the ordeal for the sake of the women.²

Ploss states that tattooing around the middle of the body comes in earlier in the history of some tribes than tattooing of other parts. The women of the Ponapé and the Tahiti islands tattoo themselves especially in the neighborhood of the vulva. After this come the breasts, the abdomen and the extremities.³ That tattooing is used for the purpose of sexual attraction there seems to be no room for doubt, but that it originated in this way is not so commonly conceded. Wundt, Gerland, Frazer and others believe that religious ideas or totemism is the original source, others think that

¹An operation Remondino suggests for civilization.

²Westermarck, *op. cit.*

³Ploss, "Das Weib."

it is done to render the person operated upon terrible or invincible in battle. Ploss is of the opinion that it is due to modesty. Some of these causes, however, are not at all remote from the sexual instinct. Modesty, if it is really present, is distinctly a sexual attraction, especially on the part of women, while success in battle is no less so on the part of men. With many races a man is not permitted to marry, nor would he be accepted by the women, until he has killed a certain number of enemies. War is very rarely undertaken for the sake of food or territory; the possession of women is the constant source of conflict between the tribes. Nothing could be more natural or more attractive to the fair sex than tattooing, which would represent their lover's prowess as well as please in a merely decorative way. It becomes a sign of a man's ability to protect his wife and family—to render their love secure, and must, therefore, be a powerful auxiliary in successful courting. The very same signs would have an equally daunting effect in battle. His opponents would fear to stand up to a man bearing such evidences of success. It is not wonderful, then, that tattooing would be found to make the warrior invincible, and might easily come to be resorted to even when not representative of former courage and address.

But although some such mental representations are very probable, yet there is no reason to suppose that beautiful, terrible or significant signs or objects do not also have a direct instinctive effect. After the preliminary displays, brandishing of weapons, boasting, vaunting and cursing, calling upon their gods and despising those of their opponents, have been duly gone through, and the enemy thus given plenty of opportunity to reflect, the more fundamental, and at the same time instinctive, part of the business still remains. In the heat of the conflict, with its necessity for rapid, energetic action, the older, more hereditary instincts have full play, and here, as with the lower animals, the beautiful and the terrible approach each other. The brightest colors, the most gorgeous banners and the most brilliant music have always had an exhilarating effect upon warriors and soldiers of every time, and no doubt an equally depressing one upon their enemies.

Among the lower races, too, the women follow their husbands and lovers to battle, their cries ring in the contestants' ears and incite them to their bravest deeds. After the battle the women become the prize of the conquerors, and sexual gratification, while the participants are still under the influence of the fight, in most instances ensues immediately. Frequently, especially with the lowest races, the women are

not unwilling captives, and would not leave their masters if they could. Victory has had upon them all the effects of a most successful courtship. In cases like these there must be an instinctive association of anything striking, or terrible, or beautiful with both the fear and passion of the fight as well as its culmination in sexual contact.

The connection of tattooing with totemism and religion may no doubt be found. But what is the position which religion occupies among the lower races? Does it not represent a residue of old experiences, a vapor which has arisen from the past, and, like the ozone of the sea or the miasma of a swamp, still penetrates the present with its influence? The heroes of one period, do they not become the gods of the next? The rites and ceremonies, the doctrines of to-day, are they not the memories of living thoughts and deeds of days gone by? To say that religious ideas are the source of any custom is only to refer one to the past, where the problem begins all over again. Not that religion may not sanctify, keep alive and modify a custom, and that at a given period the only reason known for a certain act is that it is religious, but that religion does not begin as something formal and arbitrary, but roots itself on deep biological tendencies, on thoughts and images, instincts and passions, whose neural paths are already a highway for physical and mental activities. It seems much more probable that tattooing began as a sexual attraction, when we already find so many instances of it, and that it afterwards became attached to religion, purified to an extent, and brought into contact with a wider circle of associations.

Even when religious, it does not always, if ever, lose its sexual significance. The Tahitians have a tale that tattooing was invented by the two sons of their god Taaro when they wished to seduce their sister. These two sons became the gods of tattooing. "Their images were kept in the temples of those who practiced the art professionally, and every application of their skill was preceded by a prayer addressed to them, that the operation might not occasion death, that the wounds might soon heal, that the figures might be handsome, attract admirers, and answer the ends of wickedness designed."¹

The tattooing found so frequently on the bodies of criminals of the present day is not generally so beautiful as that of the savage races, although the connection with sex is sufficiently close.² There is not the same sensitiveness shown

¹Ellis.

²Cf. Laurent, "Les Habitues des Prisons de Paris."

in the suitability of the design to the place it is intended to occupy. The lines are not, as in much of savage tattooing, made to follow the surface of the body. It has lost its decorative character and become more purely representative. In this it reflects the higher development of art and the advancement of civilization, but only in a formal way. The ideas which have led to this advancement and are contained in it are here entirely absent. Moreover, there is no reason why the most representative graphic art should not also be quite satisfactory from a decorative standpoint. The masterpieces of modern art have found a way to satisfy both demands. But the tattooing of criminals is not an art as was that of the savage races. It is lacking in appeal to the beautiful, nor is it either terrible, expressive, or even comical.

Clothing. From tattooing to clothing is an easy step. As Professor Mosely says:

A savage begins by painting or tattooing himself for ornament. Then he adopts a movable appendage, which he hangs on his body and on which he puts the ornamentation which he formerly marked more or less indelibly on his skin.

The variety of material used for clothing indicates the activity of the fancy and the desire for decoration. A simple shell, a string of beads or shells, a thin fringe of fibres or leaves, empty egg-shells, or even a thread tied round the middle or under the arms, often forms the whole dress, which is frequently only adopted at maturity, or worn upon special occasions.¹

Tasmanian dances were performed with the avowed intentions of exciting the passions of the men, in whose presence one young woman had the dance to herself. During these dances the women wore a covering of leaves or feathers, which was removed directly afterwards.²

From a large number of similar cases Westermarck concludes that the feeling of shame is not the origin of the adoption of clothes, but that in many cases, at least, "men and women covered themselves to make themselves more attractive—the men to the women, and the women to the men." When all go perfectly nude, he says, "nakedness must appear quite natural, for what we see day after day makes no special impression upon us. But when one or another—whether man or woman—began to put on a bright colored fringe, some gaudy feathers, a string with beads, a bundle of leaves, a

¹ West of Tanganyika the people go naked, but by a manipulation of the fatty tegument of the lower body in childhood, they produce an apron which hangs down almost to the middle of the thighs. (Schurtz, "Philosophie der Tracht," p. 21.)

² Westermarck, "Human Marriage."

piece of cloth, or a dazzling shell, this could not of course escape the attention of others: and the scanty covering was found to act as the most powerful obtainable sexual stimulus. Hence the popularity of such garments in the savage world."

These facts undoubtedly show the closest connection between clothing and the attraction of the sexes as Westermarck points out, but it is not to be understood by this that clothing itself is, normally, a direct appeal to passion. Simply to attract attention to the sexual organs can, surely, not be the whole of the purpose. For this, a gesture, the mere exhibition of the body, the simplest expression of desire, would be much more effective. The brilliant colors, the odd and curious forms of primeval dress and ornament, must have the effect of awakening mental processes which intervene and tend to postpone the sexual climax. They must represent a margin, an overflow, which engages the attention with something else than immediate gratification. The primary effect will be to momentarily withdraw the sexual impulse when that is present, and to allow of an irradiation where the mind is engaged with visual sensations not primarily the sign of sex. That the wearing of bright objects is believed to have the effect of warding off danger, is shown in their use to avert the evil eye, which is often only a synonym for an uncontrollable sexual passion. By the use of such objects the attention is directed rather to the personality than to the person, which is always sufficiently plain. It is an attempt to display psychical rather than physical features. The bit of ornament is an expression of an inner state, of a sensitiveness higher than the crude though powerful sensations of sex, and it is for this reason that it becomes at last an attraction and may be preserved by sexual selection. Ornamental clothing is not a simple lure. It is a sign or symbol of a greater refinement of perception and delicacy of feeling, and the man or the woman who gives the best evidence of these qualities is the one who is chosen by members of the opposite sex who possess such qualities themselves. The attraction is in the mind and not in the sexual organs.

But if higher considerations do not inhibit its activity (and here also we see the value of a margin), and the sexual instinct is to obtain its culminating satisfaction, the wider irradiation by spreading an erethism throughout the higher centres of the brain, will, by its reaction on the system, only aid in arousing and strengthening the natural performance of the sexual function. The objects of beauty may then very readily under the influence of passion at white heat become identified with its pleasure and satisfaction, and apart from the representative effect of which we have already spoken

become instinctively connected with purely sexual feelings. When, however, this instinctive connection leads the rest, the sexual instinct has lost its highest potentiality, has retreated and fallen back upon its centre, and although it may be more concentrated and rank, is also more easily defeated in the struggle for existence. This difference between a symbolism which is alive and growing and one which is only instinctive, is the difference between art on the one hand and a degraded fetichism on the other.

Shame, Jealousy, and Fear. Let us now turn to another phase of the question of clothing, where we find a symbolism more of a moral than an artistic nature. Jealousy, as we have already seen, is very frequently an underlying feature of the passion of sex, and far from being sloughed off with advancing development, has gradually shown itself more plainly in the higher species. The institution of marriage, both in man and in the higher animals, especially in the quadrumana, is largely ascribable to its influence. Schurtz¹ is of the opinion that the feeling of shame in the human species is connected with jealousy and an outcome of social development. The desire of the man for complete possession has given rise in the woman to a desire to conceal and protect what is regarded as valuable. He gives instances which indicate that people who are habitually naked, yet show the effect of shame, and occasionally hide the sexual organs. He states that in the most of cases, and the exceptions are those of the lowest races, it is the women who are more carefully covered, and he thinks that the use of clothes which begins with the sexual organs is the "outer expression of a specific human morality." He points out that it is the married women who are the most frequently and most completely clothed. That the dress, however scanty, is the recognition of this condition, and the sign of its approval by the tribe, an indication of the fact that the wife belongs to one man; "that for other men she exists no longer as a woman, but only as a human being." Schurtz mentions as other possible sources of the use of clothes, the need of protection from weather, flies, and small injuries, the desire for ornament and decoration, and the desire to distinguish classes or individuals, by way of trophy or princely signs. He regards the æsthetic ground as the least probable of any of these sources, and says that the sculptor, who knows much more than these uncivilized people of the tropics what beauty means, does not cover up the naked body, but unsuspiciously reveals it—that he would find it the greatest prudery to be untrue to nature, and that we never find the

¹"Die Philosophie der Tracht," p. 17.

purely natural ugly, so long as influences from other sources do not work upon our feelings, *i. e.*, that there shall be no sexual stimulus. When, later on, he speaks of clothes in art and particularly in sculpture, he says that the figure here does not come under the same laws as in reality, that in art, clothes may be used as an ornament or as a means of expression, but not as a covering. He also admits that although clothes are originally used as covering, and therefore more by the women than the men, it is just with the women that, later on, they become more highly decorated and serve as a means of attraction.

The weakness of this theory lies in the fact that it does not account for the wearing of clothes by men, and if the lowest races represent the earliest stages, it would appear, according to Schurtz's own admission, that men began to use clothes first. But as to the priority of their possible origin, we are not for our purposes particularly interested. Whichever is first, all of them are actually found as causes for the use of clothes. The mere starting point, a very difficult thing to determine, is of much less consequence than the natural trend of the associations. It may very possibly be that different tribes originally used dress for different reasons, but the question is, having adopted it, do they not lay great stress upon it as a means of beautifying themselves, rendering themselves attractive or producing an impression of value and importance, especially conducive to success in love? The feeling of shame itself, with its derivatives, modesty on the one hand, coquetry on the other, is undoubtedly a great attraction, tending to satisfy and allay the jealousy which underlies the sexual passion.

From a consideration of the facts it seems reasonable to take the view that men and women adopted dress for different motives—the man originally for the purpose of decoration and attraction, the woman for the purpose of a covering. In this the sexes are true to the characteristics they have shown throughout the animal series. The feeling of shame is not originally a male quality, nor deeply rooted in the sexual instinct regarded by itself. It is related rather to fear and an outcome of self-preservation, conservative in its tendencies, and characteristic of the female diathesis. This does not prevent its having been selected by the males as a result of their rivalry and jealousy of each other, nor its transmission by heredity to the males themselves. It is clear that like the other foils of the sexual passion, shame must be overcome by love before the culmination of the final act. The jealousy on the part of the man, the fear to offend this on the part of the woman, of which the concealment of the person

may be an expression, would have no meaning but for the sexual instinct, and the possible gratification thereof which has called them forth. No doubt the feeling of shame is a specific human morality, but it has its origin in sex. It is made to be overcome, and the acts of display, of attraction and ornament, which tend to affect this purpose must be a deeper and more fundamental expression of the sexual instinct, which however only shows its strength and range as it becomes more widely irradiated. As Mantegazza says :

The more one simplifies love and reduces it simply to a connection between two persons of opposite sex, so much the less easy is the development of jealousy and the less complicated is the sensuous ceremonial. The more it is surrounded by the feelings of shame, coyness, secrecy, and obscure and undefined ideas, the more full of sensation and tenderness becomes the whole mechanism, but also the more easily broken.¹

The moral and the æsthetic values of clothing are thus not really opposed. Both, as irradiations of sex, increase each other's effect. The delicate and even severe morality of the present day in matters of dress, probably tends to accent, if it makes more rare the æsthetic sensibility, as well as the keenness of the sexual feeling from which it is derived.

Symbolism and Fetichism. In their estimation of what is beautiful and attractive, savage races are greatly influenced by the smallest and finest distinctions. Of the thousands of possible beauties which such an organic structure as the body might present, they pick out one or two to which they pay attention, while they neglect the rest. A view which is able to grasp the harmony of the whole and knit together the greatest variety of detail seems impossible to them. One tribe will insist upon some few characteristics which it sets up for admiration, while an adjoining tribe, with almost the same material to work upon, picks out characteristics and originates manners and customs entirely different. It seems as if, at all costs there must be emphasis, there must be a focus, whether that is situated so that its penumbra takes in the greatest possible remaining beauty or not.

The religious spirit is equally close and narrow. A stick or a stone which differs but unimportantly from many another, is seized upon, its differences magnified in the imagination by the very act of attention, and set up for adoration. The turning of a feather will determine an expedition. The doing of a thing at a certain time and in a certain way without the deviation of a hair, and many more such whims, fears and superstitions, present the same psychological features.

¹ Anthropologisch-cultur-historische Studien über de Geschlechtsverhältnisse des Menschen, p. 39.

This fetichism is of course not absent in the lower animals, but in man it reaches a fineness and discrimination to be found nowhere else. It depends primarily upon an increase of the psychological process of representation, involving greater powers of comparison and analysis as compared with the lower animals. The outer impressions come to be clearly distinguished as such, but at the same time are often treated as symbols of inner experiences, and a meaning read into them which they would not otherwise possess. Symbolism or fetichism is, indeed, just the capacity to see meaning, to emphasize something for the sake of other things which do not appear. In brain terms it indicates an activity of the higher centres, a sort of side-tracking or long-circuiting of the primitive energy. It is not the mere sensuous impression of the crooked stick and the attendant reflexes which have control. This impression has given rise to another process, which for the moment dominates the brain, and under whose influence it actually neglects what is more immediate and apparently more real. The stick itself becomes the symbol for this peculiar and otherwise expressionless experience, and it is set up as a fetich or a god. Once having obtained this focusing power, the advancement of humanity is determined by ever-increasing improvements in its adjustment and its range.

As already stated, it is neither in the absence of sexual excitement nor in the very height of it, that the margin making possible the formation of a fetich or sensuous symbol, occurs. Movements capable of leading up to the climax are more productive in this respect. Particular movements of the dance, particular decorations have their origin here, and tend to become symbolic and fetichistic. J. Donovan,¹ in "Festal Origin of Human Speech," speaks of the absorptive power of sensation under festal excitement. "We must not lose sight of the absorptive elements of sensation, the regular movements of the body, the rhythmic sounds of sticks and stones, the rhythmic and articulated cries. It is, perhaps, impossible to estimate too highly the value of this absorption for enabling the festal excitement to mould the natural passions according to its own tendencies instead of being destroyed by them." Rosetti's poem, "The Woodspurge," gives a concrete example of the formation of such a symbol.

"The wind flapped loose, the wind was still,
Shaken out dead from tree and hill;
I had walked on at the wind's will,—
I sat now, for the wind was still.

¹ *Mind*, July, 1892.

Between my knees my forehead was,—
 My lips, drawn in, said not Alas!
 My hair was over in the grass,
 My naked ears heard the day pass.

My eyes, wide open, had the run
 Of some ten weeds to fix upon:
 Among those few, out of the sun,
 The woodspurge flowered, three cups in one.

From perfect grief there need not be
 Wisdom or even memory:
 One thing there learnt remains to me,—
 The woodspurge has a cup of three."

Here the otherwise insignificant presentation of the three-cupped woodspurge, representing originally a mere side current of the stream of consciousness, becomes the intellectual symbol or fetic of the whole psychosis forever after.

It seems, indeed, as if the stronger the emotion the more likely will become the formation of an overlying symbolism, which serves to focus and stand in place of something greater than itself; nowhere, at least, is symbolism a more characteristic feature than as an expression of the sexual instinct. The passion of sex, with its immense hereditary background, in early man becomes centered often upon the most trivial and unimportant features, which are often not at all representative of profound biological affinities, such as are without doubt the bright colors, beautiful voices, etc., of the lower animals. The mutilations, the tattooings, the rites of puberty, the dress, the ceremonies so rigidly insisted on as a preliminary to sexual gratification, indicate, however, a psychic advance. This symbolism, now become fetichistic, or symbolic in a bad sense, is at least an exercise of the increasing representative power of man, upon which so much of his advancement has depended, while it also served to express and help to purify his most perennial emotion.

While this is an account of the inception of a symbol or fetic, after this has once been established it is not necessary that there should, especially among the majority, be much if any conscious reference to its significance. Its effect on the sensibility is assured by heredity and social custom. It may even lose its meaning, or become loaded with a meaning much larger than was originally intended, while at the same time it becomes more in harmony with the basal æsthetic-physiological demands of the retina, the ear, or the sense of movement. Plenty of our conventional designs have had just such a history, as well as many of the words and gestures which we unthinkingly or superstitiously use.

Phallicism. The necessity of human nature to focus attention upon something which becomes a sign or symbol of other things more important than itself, played a great part in the early phallic religion. Here was an attempt, immense, profound, to envisage the whole of a scattered experience and give it form.

Phallicism is not a religion characteristic of the very lowest races. In Africa to-day it is strong with the Dahomeyans, among the sturdiest races of the blacks. It lies back of Aryan history. The Bibles of the world imply it, as do much of present rites, ceremonies and sacramental costumes. The legend of the Holy Grail and the noble figure of Sir Galahad have descended from it.

It seems strange that the worship of the generative organs, and particularly of the male organ, should be the natural continuation of that instinct for the beautiful which, as an outcome and irradiation of the sexual passion, we have already observed in operation with man and the lower animals. But no one can understand phallicism who fails to observe how closely interwoven it is with society and the gods. It is no private cult, nor does it depend merely upon free sexual selection and the rivalry of individuals. It is a great idea, able to constrain the hearts of thousands. This is the source of its beauty as well as of its usefulness in the struggle for existence among warlike nations. As a great idea it bound the people together and summed up an immense circle of outward irradiation. Ancestor worship, tree and serpent worship are phases of phallicism. The goat, bull, serpent, tench, turtle, domestic cock, scarabæus, dove, pig, lotus, the constellations, the moon and sun with fire its earthly representative, heat and moisture, pyramidal stones, artificial obelisks and pyramids, uprights generally, from which have probably descended our church steeples, the globe, the cross,¹ and many other forms, as symbols of death and life, generation and regeneration, are interchangeable with the human phallus.

Lajard² traces phallicism to its oldest known forms among the Chaldeans. Their philosophy was, in a word, the universality of generation. Everything waxes and wanes. Periodicity is the world-law. Sexuality is its expression and

¹Count Goblet d'Alviella ("La Migration des Symboles") takes the view that crosses are cosmogonical, the four arms symbolizing the four directions. As a sign of the weather they would come to be a token of health and good wishes. This is not contradictory to a phallic interpretation. As we shall see, phallicism could not become a religion until it became cosmogonical, and in that sense universal.

²"Culte de Venus."

its most important typical phase. The oldest god is male and female in one : the bearded Venus, the heavens and the earth. It was by the division of this mystic hermaphrodite that the sexes were formed and Venus Pandemos became Venus Aphrodite and Hermes or Priapus. The original human being was also bisexual, and afterwards divided by the gods into man and woman. This first state was one of quiescence, symbolized sometimes by the egg, from which everything comes.

By comparing all the varied legends of the east and west, we obtain the following outline of the mythology of the ancients: It recognizes as the primary elements of things two independent principles of the nature of male and female: and these in mystic union, as the soul and body, constitute the Great Hermaphrodite Deity. THE ONE, the universe itself, consisting still of the two separate elements of its composition, modified, though combined in one individual, of which all things are regarded but as parts.¹

Associated with this bi-sexual philosophy of things, originating contemporaneously, or derived from it, is a trinitarian explanation, which is also essentially phallic in its symbolism and application. When the original unity became divided into powerful separated deities, it still seemed to maintain a certain existence in the minds of believers, first as a general ground of existence and afterwards as an independent personification. The sun in some religions is entirely masculine; Baal and Moloch are characteristic Semitic forms; but in many cases in the sun became concentrated the three persons of the Deity. These were distinguished as the creating, the preserving, and the destroying powers. In Hindostan, Brahma, Vishnu, Siva; in Persia, Oromasdes, Mithra, Ahriman; in Egypt, Osiris, Neith, Typhon.² These forms are more philosophical and later phases of phallicism, and, although they absorbed the strength of the earlier phases, yet often left them behind to continue their hold upon the imaginations of the lower classes. In case of any conflict it was always open to the leaders to identify their more cultured art and religion with the cruder forms. The worship of Jugger-naut, or the great creator, as the word signifies, for example, goes back to the very earliest times. This god is worshipped in the form of a bull, which is identified with Taurus of the zodiac. According to Higgins, Inman,³ and others, his worship has been carried on from the time that the sun in the vernal equinox was in the first degree of Taurus, 6,600 years ago. After passing through Taurus, the sun appeared in

¹ Corey's "Fragments."

² Godfrey Higgins, "Anacalypsis," p. 13.

³ "Ancient Faiths."

Aries, which also, with its earthly representative, became a phallic sign.

The sacred word, Om, is a symbol of the Hindoo trinity. It is in the original spelled with three letters, and, as Higgins¹ says, it would be better expressed in English by Aum, Aom, or Awm. The first letter stands for the creator, the second for the preserver, and the third for the destroyer. Sir W. Jones says that the mystical word Om signifies the solar fire. In an old Purana we find the following passage: "All the rites ordained in the Vedas, the sacrifices to fire, and all the other solemn purifications shall pass away, but that which shall never pass away is the word Om — for it is the symbol of the Lord of all things." Higgins thinks that this word is found in the Greek *omphi* (an oracle) or *omphalus*, which is related to the Latin, *umbilicus*. It will be remembered that the Hindoo devotees, while repeating their sacred word, sit with crossed legs gazing at the navel. The position is also physiologically in harmony with a half ecstatic abstraction.² The word *trionphe*, repeated in the Dionysiac festivals, is *trionphe*, i. e., the triple *omphe*, although this might be repeated in Greece without any idea of its origin or meaning than that of its being a sacred word. Inman believes that the word John with its synonym Jack are of phallic origin, the first form of John being IO or ION. He identifies the O with the *kteis*, or female organ, I, the upright, with the phallus. The Hindoo word YONI, the emblem of the female organ of generation, is another form of it. Jack is a form of Iacchus or Bacchus, the sun god, and belongs to the male side of the symbolism. Both words were used in the revels of the Eleusinian mysteries, which were descended, as Plutarch suspected, from very ancient times, and were probably survivals of the spring festivals of savage people, in which sexual excitement is such a prominent feature. In Greece and afterwards in Rome, these mysteries became the occasions of the wildest orgies. Maids and matrons ran wildly through the woods, naked or clothed in skins, with serpents in their hair. They carried with them sexual symbols, flourishing torches, which continued to burn when plunged in water. They tore animals to pieces in their fury and ate the flesh raw and quivering. In the festivals in honor of the reproductive powers of nature, held in Rome in the month of April, "the Phallus was carried in a cart and led in procession by the Roman ladies to the temple of Venus outside the

¹ *Op. cit.*, p. 126.

² A return to the position of the embryo.

Colline gate, and there presented by them to the sexual parts of the goddess."

With the advent of Christianity these ancient feasts were re-edited and made to speak more purely, if more abstractly, of reproduction and immortality, generation and regeneration. The higher elements of religion and art, the sentiment for nature, and religious adoration characteristic of the spring, would seem to have lost to a very large extent their sexual content; although the intensity of feeling and emotional depth which accompany these higher manifestations, proclaim themselves as the natural transformation of the primitive energy of sex. The preliminary fasting, the repression of the sexual instinct during the time of Lent, the determination of the date by the changes of the moon, a female symbol, besides many popular customs, *e. g.*, the eating of eggs, of hot cross buns, also show how much the new form has been dependent on the old.

The story of the fall is referred to in the history of many different nations, and told in many different ways, which are yet essentially similar to the account given in our own Bible. In many of these cases there is an undoubted phallic reference. According to the Persian legend, "the first man and woman were seduced by Ahriman under the form of a serpent, and they then committed 'in thought, word and action the carnal sin, and thus tainted with original sin all their descendants.'" Wake¹ says "eating the forbidden fruit was simply a figurative mode of expressing the performance of the act necessary to the perpetuation of the human race — an act which in its origin was thought to be the source of all evil." The serpent is continually associated with phallic symbols, and becomes itself a phallic sign. The cobra of India is said to copulate while standing upright in the double twisted form, represented in the Caduceus of Mercury. Wake² says that the Phœnicians supposed that the serpent had the quality of putting off its old age and assuming a second youth, connected probably with the casting of its skin, a quality which was made use of in typifying generation and eternity.

This short account of the symbolic side of phallicism will suffice to indicate its great fertility and resource. The symbols we have been dealing with, although they represent the spirit of a past religion, are in themselves forms of art, productions, inventions, which appeal directly to sensibility, whatever other content they may possess. Sculpture, architecture, the graphic arts and poetry in no less degree, were

¹ Westropp and Wake, "Ancient Symbol Worship," p. 39.

² *Op. cit.*, p. 45.

the channels through which they flowed and by which they have come down to us. The rites and ceremonies are often but the abbreviated remains of a presentation essentially dramatic. The sacred words are concentrated poems, and are received and felt by devotees with a corresponding ecstasy.

But there is another side of even greater consequence, the emotional and active side, and it was the union of this with an intelligible symbolism that made phallicism what it was. The relationship that exists between these two is very much the same as that which obtains between money and wealth. The formal and intellectual side is of no value apart from the wealth of feeling, emotion, sense of value and worth, which it expresses and renders more easy of manipulation and exchange. The value of symbolism to the sexual instinct lies in its capacity to utter the vast and unknown past that wells up in every man who feels and thinks, and at no time more poignantly than under the influence of love. How, then, did phallicism play upon or express these original and voiceless powers?

In the first place, indistinct and complicated symbolism itself effects the more irradiated portions of the imagination, and favors a filling of reverie, mysticism, and other sensuously tinted lesser emotions, which lead naturally, in the healthiest natures at least, to the complete vigor of the sexual passion. But there is no place in which phallicism shows its depth and range more distinctly than in the way in which it exploits the associated passions of fear and anger, and through them intensifies the upward recoil of confidence, faith and love. Death is constantly brought face to face with love in its most ecstatic condition. Says Higgins¹ of these early times, "Everywhere throughout all nature the law that destruction was reproduction appeared to prevail," and that this (a very suggestive point) led as its natural outcome to the belief in the transmigration of souls. The worship of the serpent was particularly characterized by these cruel and terrible excitements.

The representations of Kali, the goddess of nature and fecundity, may be taken as an example:

She is entwined with serpents; a circlet of flowers surrounds her head; a necklace of skulls; a girdle of severed human hands; tigers crouching at her feet,—indeed every combination of the horrible and loathsome is invoked to portray the dark character which she represents. She delights in human sacrifices, and the ritual prescribes that previous to the death of the victim, she should be invoked as follows: "Let the sacrificer first repeat the name of Kali thrice, Hail Kali! Kali! Hail Devi! Hail, Goddess of

¹Anacalypsis.

Thunder! Iron-sceptered, hail, fierce Kali! Cut, slay, destroy! Bind, secure! Cut with the axe, drink blood, slay, destroy!" "She has four hands," says Patterson, "two of which are employed in the work of death; one points downwards allusive to the destruction, which surrounds her, and the other upwards, which seems to promise the regeneration of nature by a new creation."¹

Conversely, it is to be noted that the æsthetico-sexual erethisms are perhaps the only producers of devotion and sacrifice, which still, as in phallic times, imply a reference to death. Sacrifice for religion is still possible, and there are yet students of beauty who starve on a crust for the sake of art.

Phallicism in the minds of these early people had in it nothing indecent. As Payne Knight says, the act of generation was considered as a solemn sacrament in honor of the Creator. In some countries it was performed by the priest or prince before the assembly of the people. The virgins participating in the act were highly honored. Many, in fact most, of the ancient temples and surroundings were favorite places for sexual congress. When the gods allowed the birds this privilege within the sacred precincts, it was thought the act could not be displeasing to them. Accordingly doves were often associated with the temple worship. In these temples troops of women were kept for the purpose of ministering to the sexual needs of the devotees. They were often the most beautiful and the most highly honored in the land, and a great distinction was made between them and the prostitutes who sold their bodies for their own gain. The children of these unions were brought up in the temple and the best of them were used in its service.

Dulaure says that these customs overcame the excessive rancor of war between different peoples, (strangers being frequently favored) and that they made the nation more numerous in a time when numbers were of the greatest importance.

Despite its cruelties, phallicism was essentially a religion of reverence and love. Ancestor worship and the love of fatherland which springs from it have their roots in phallicism. The Greek Lares and Penates were the rude representations of male and female organs of departed ancestors. They were placed over the fire-place, because fire represented the sexual flame or life, "the engenderer of the heavens and the earth."²

Even the serpent himself, the most venomous and deadly of beasts, gets tamed beneath its influence, and becomes the symbol for wisdom and healing.

¹"Ophiolatrea."

²Cf. Jennings, "Phallicism," p. 286, and Forlong's "Rivers of Life."

The crucified (brazen) serpent, adored for its healing powers, stood untouched in the temple, until it was removed and destroyed by Hezekiah. . . . The sacred snake of Athens had its abode in the Acropolis, and her olive trees secured for her the victory in her rivalry with Poseidon. The health-giving serpent lay at the feet of Asklepias, and snakes were fed in his temple at Epidauros and elsewhere.

The old terror worship tended to die out, and it is in the higher forms of religion that we find the serpent lingering longest as a symbol of beneficence. It still remains with us as one of the insignia of the medical profession, and in the marriage ring. As with other forms of art the tendency has been to eliminate the less permanent pleasure-giving features, which become less and less in harmony with a higher civilization.¹ It is not darkness, snakes, and gore, that are the objects of fear to the modern man, and against which his courage may rise to intoxication. His terrors are more intangible and on a higher psychical plane. The vast irradiations of society and the difficulty of finding one's niche, the fear of insanity and disease, and of the incalculable effects of heredity, of losing one's grip, the dread of the slightest jar in the ideal harmony of two loving souls, the immense weariness in presence of that strange destiny of the universe in whose presence the best effort seems wasted,—these are the weird terrors, typical of the modern man, and before which both generating and regenerating love are too often overthrown.

Modern Phallicism. The question naturally arises, has phallicism any message for the present times? No vital religion has neglected the sexual nature, of which with all the "jenseits" it is originally an irradiation. It is only in periods of weakness and decadence that these extremes become opposed or dissociated. In this respect it is to be doubted if modern civilization has succeeded in increasing the advantages of a stimulating and purifying solidarity inherited from the past. Early Christianity was not nearly so negligent. Its combat with preceding religions forced it to take practical cognizance of the rankness that underlies all nature, and it was not for many centuries that the attitude of the church became purely negative and ascetic, nor until Puritan times that these qualities became the possession of the people.

A return to phallicism, as we see it historically, would be like modern tattooing, an art of criminals, which could never be the equivalent of the original vital thing itself. The same instincts, however, still exist, and if unhandled by the natural leaders of society, become atavistic and reactionary. The

¹Cf. Marshall, "Pain, Pleasure and Aesthetics."

Puritan repression is too self-centered. The purity that does nothing more than keep itself unspotted from the world, is unsuited to our growing wants and larger social consciousness. What we need at present is a modern phallicism, a religious and artistic spirit that goes out to meet the sexual instinct, and is able to find in it the centre of evolution, the heart and soul of the world, the holy of holies to all right feeling men. We need the manly courage and noble love which are able to protect and to enshrine the beautiful body and soul of woman, able to be faithful in the perilous days of youth to her dear image, shining yet as through a glass, but darkly, a fidelity able to keep this dim and evanescent imagination like a charm against coarse seductions. This ideal we need to base upon the facts of biology and history. No abstract dream will stand the strain of our present knowledge of the world, nor the intimate experiences of married life. This *joî de vivre*, like all the irradiations of sex, must be an outcome and an overflow of our present actual circumstance.

Some of our best literature shows a dawning of this idea. Goethe's *Faust* is strongly sexual. The witches' kitchen in which *Faust* drinks the rejuvenating draught which enables him to see a *Helena* in every woman that he meets, is typical according to Goethe's admission in conversation, of the influence of sex. The outcome of the whole drama might be summed up in the words—to adopt Bayard's translation: "Ever the womanly lifts, leads us on." The French poets are admittedly sexual, sometimes atavistically so. De Musset boasts in one of his lyrics of having sung "*la rouerie*" to the young men of France. Swinburne in a much more pessimistic way had at one period a similar tendency. Tennyson appeals with appropriate delicacy to the tenderest of sentiments. Of 120 poems in a volume of selections of Browning, sixty-three are sexual in subject.

But it is not necessary that art should deal with this problem in so many words. Passion is better touched by an unseen hand. Suggestiveness that reaches to the subconscious regions is deepest of all. So we find many poems and other art works, which without a word of sex are simply embodiments of its movement, and have a similar effect upon the feelings. The very essence of everything lyric in poetry, paint, or music, is the heart-bursting overflow of love, and it strangely follows even in its form, the play of the successive moments of a sexual passion. When a poet sings as the bird sings because he must, like the bird, he can not fail to embody the erethic qualities of sex. That he may be unconscious of the biological source of his enthusiasm, is at

least no argument against its existence. Browning in his "Women and Roses" gives us an example of what is meant. The first five stanzas follow an emotional crescendo, which is filled with beautiful, vague and mystic images, and overflowing with tender words. The fifth stanza breaks through all reserve :

"Deep as drops from a statue's plinth,
The bee sucked in by the hyacinth,
So will I bury me while burning,
Quench like him at a plunge my yearning ;
Eyes in your eyes, lips on your lips!
Fold me fast where the cincture slips,
Prison all my soul in eternities of pleasure,
Girdle me for once! But no—the old measure,
They circle their rose on my rose-tree."

In the following and closing stanzas, Browning irradiates the passion and carries it upwards to the stars. The effect here is of course dependent on the matter as well as upon the form, and is so clear that it seems as if Browning must have been distinctly conscious of the principle.

Many technical forms, *e. g.*, that of the sonnet, with its slow and measured octette, its more rapid, impassioned, and variable sextette, show a similar spirit, as does the movement of many musical compositions, even when the musical content is not directly amorous. Although it is not so transparent to the most of observers, the aim of painting is also lyrical. The joy of the artist in his work, and the embodiment of that joy in his productions, is the largest factor in successful painting. The go, the snap, or the larger and steadier enthusiasm which takes longer to appreciate, is all upon the canvas for every one to read. The mere portrayal of objects, mere drawing, is the crudest thing a painter has to do ; color and the mystery of tone, so thoroughly dependent on health and mood, are the essence of his activity. Brush-work, instead of being an art for artists, becomes the most intimate expression of life within the painter's grasp, and is, as may be supposed, the last and most difficult art to be attained, without sacrificing more fundamental and basal qualities. In this respect, the aim of painting, as some one has said, is to express everything with two dots and a dash. It is here that the first weariness is detected, so destructive to all art work. A recent painter is said to have practiced for several months till he could express the wet rim of a cart-wheel, reflecting sky and trees, and quite of a character of its own in form and

texture, by one large sweep of his brush—a *tour de force* which is not lost upon the sympathetic observer.¹

With the assumption of the reflex arc as the unit at the basis of our psychic life, it is not difficult to state these inter-relationships of art and sex in physiological terms. Let us

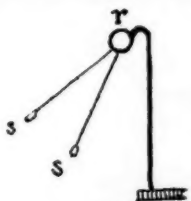


FIG. 1.

suppose sr to represent such an arc, in which sr , sr are two afferent nerves; r , the reservoir of energy or nerve cell, and rm , the efferent nerve leading to the muscle m . In order to make the diagram as graphic as possible, I have represented the reservoir r with a curved outlet of large capacity, capable of being emptied only when r is filled, and, in the present state of neurology, it will do little harm if the arrangement is pictured somewhat after the manner of a hydraulic siphon apparatus, which is filled from s , s and emptied at m . To carry the comparison farther, if we suppose that there is a certain amount of evaporation or leakage from r , we shall have an illustration of the failure of a repeated stimulus to produce a reaction when the time elapsed has been too long. The emptiness of the reservoir will represent fatigue, and a soakage inwards will stand for the effects of nutrition. The narrow channels, sr , sr , forcing water into r , will represent the effect of a stimulus. This will then represent what occurs with the primitive sexual as well as with any other form of simple reflex. If r is already well nourished, or in a full, almost overflowing condition, it will take very little stimulus from s to fill it up to the point of discharge. If the stimulus is slight or the cell comparatively exhausted, it must be repeated at short intervals or with increased intensity to produce the same effect.

Further important characteristics of nervous reactions imply the development of a system and the addition of other connected cells (possibly by induction, as the work of Golgi

¹It is interesting to observe the way in which the modern novel (which is to be regarded as essentially a form of the drama) provides the associational frame-work for the sexual passion. The more vulgar and most salable forms pass quickly on the most insufficient pretext, judged from a realistic standpoint, from one phase to another of passionate declamation, interlarded frequently with descriptions of terrible accidents, of plots, murders and other scenes which play upon the auxiliary emotions of fear and anger. The better class of novels in attempting a deeper analysis of life still appeal to the passion of love, even when that subject itself is ostensibly omitted.

and Cajal would indicate). In the diagram (Fig. 2) another motor cell of less capacity, but with more highly differentiated, less somatic sensory avenues, is united to the first by a fibrous connection. In the language of our comparison, another reservoir has been added. It will now be more difficult to fill r from the direction of s, s at least, as there is a completely developed leakage to r^1 , but when both reservoirs are filled and both discharged, the effect will be greater, representing more muscular and glandular elements brought into play. If the influx to r is rapid, it will be capable of being discharged alone and before r^1 is filled (owing to the small capacity of the fibrous connection), but the discharge will not be so copious nor the results so effectual as if r^1 had been used. Moreover, if r^1 is not brought into play it will leak back into r , and there will be another discharge sooner, and, if r is stimulated rapidly again, weaker than if r^1 had been properly fatigued. This will represent the relationship between the fundamental sexual functions, erection, discharge of glands, etc. (r), and the more irradiated parts of the system (r^1) when copulation is the aim in view. The ideal curve of the whole activity will be slow and high and consequently of infrequent occurrence. It will rise gradually and fall rapidly, while the partial activity will be rapid and more frequent. The curve a ,

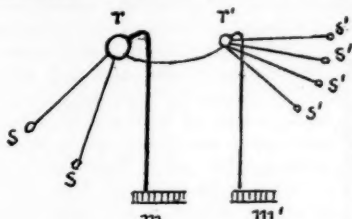


FIG. 2.

s, s^1 , sensory end organs.
 m, m^1 , muscles or glands.
 r, r^1 , reservoirs of energy or nerve cells.
 sr, s^1, r^1 , afferent nerves.
 rm, r^1, m^1 , efferent nerves.

Fig. 3, will represent the first, b the second. The irradiated portions (r^1), however, are not always used in the interest of sex. The cell r^1 is capable of being stimulated by its own sensory avenues (s^1, s^1, s^1), and, if this is rapid and frequent, discharge of r^1 may occur without leakage to r . In such circumstances the overflow of r will fill up r^1 and increase its capacity to discharge, while its own action is thereby postponed or inhibited. These two reaction systems represent the relationship of sex and art. In a highly developed system, however, this relationship is mediated by countless possibilities of reaction or motor cells. The secondary sensory apparatus becomes highly developed, particularly in the eye and



FIG. 3.

Fig. 3, will represent the first, b the second. The irradiated portions (r^1), however, are not always used in the interest of

sex. The cell r^1 is capable of being stimulated by its own sensory avenues (s^1, s^1, s^1), and, if this is rapid and frequent, discharge of r^1 may occur without leakage to r . In such circumstances the overflow of r will fill up r^1 and increase its capacity to discharge, while its own action is thereby postponed or inhibited. These two reaction systems represent the relationship of sex and art. In a highly developed system, however, this relationship is mediated by countless possibilities of reaction or motor cells. The secondary sensory apparatus becomes highly developed, particularly in the eye and

ear. With the development of the brain, an association system becomes possible and the sensuous phantasy comes to take its place as the most irradiated portion of the psyche,

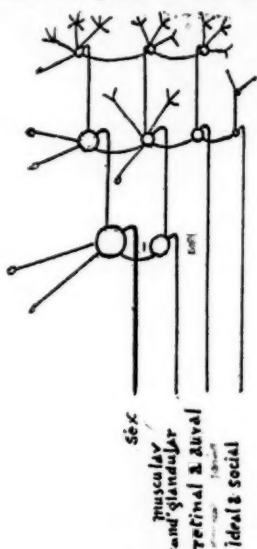


FIG 4.

not excluding even the primary sensations of the eye and ear. The accompanying diagram will show a way in which this radiation may be supposed to have been carried out. The action of r^1 , r^2 , etc., represents the form of action, which is characteristic of all the senses which bring us in contact with the outer world. It is quick and recovers easily. Normally, the eye and ear are always ready. The more somatic activity of sex, on the contrary, reacts powerfully, and does not recover to its full extent for a considerable time.

The outer senses, too, and their intellectual derivatives are used for the most part symbolically, and with reference primarily to the inner and somatic sense, that euphoria of which the sex instinct is the best marked active outcome. When the

outward senses become detached from their emotional background, as if the connection between r and r^1 (Fig. 2) were destroyed, their action becomes mechanical, while the underlying instincts, in the present case that of sex, either dwindle through lack of use, or discharge weakly without the assisting relays of the higher functions. An activity of the outer senses and the intellect, which is in close connection with the emotional background is the best arrangement for both. The higher senses and the intellect, however, act better prodromal to or independently of an actual sexual passion. That is, they act with a quicker reference to the outside stimulus peculiar to them. Under the influence of passion, although their energy may be as great, their stimulus and discharge are subordinated to the more somatic functions of sex.

General Features and Laws of Courting. Let us now turn our attention to some features of the sexual functions by which they are related to the general problems of life and the interaction of individuals. When a cell reproduces by division, both of the parts do more work in growth and assimila-

tion than before. Preliminary to division, as is most clearly shown in the protozoans, the cell gives evidences of disruptive tendencies. It has become so large that neither absorption nor excretion can be carried on with facility; it is necessary that its mass should be diminished with reference to its surface. Sometimes division occurs spontaneously; at other times, and more frequently, conjugation is necessary, as if the decided increase in size were a condition precipitating division. At this period, as we have already seen, katabolic changes and consequent evolution of energy are characteristic features. The tendency to destruction precedes division, and it would appear that the orderly carrying out of a disruptive process in division were the means which nature has adopted to overcome the necessity of death. It is at the moment of approaching exhaustion and imminent destruction that a cell divides, preceded or not by conjugation, and transmits the life which it is unable to retain. With the metazoan the case is not essentially different. Here the individual margin is greatly widened, but it is endowed with instincts inexplicable from the individual standpoint, leading it to shape its existence as if it were the bearer of a life more important than its own. An extension of the individual margin seems to follow only when there occurs some improvement which makes it more useful to the movement of the race. From this point of view, the individual appears as a debt which is owing to the reproductive processes in which life becomes eternal. Die to live, is at least one side of the law of sex.

The reproductive erethism is, thus, at the same time the result of high nutrition and the expression of decay. Physiological chemistry indicates that the products of assimilation rise in chemical complexity under favorable conditions found in the body. As the complexity increases they approach the critical point, where, with a slight change in the conditions, a new compound might be formed, but without which the already complicated molecules break up on the slightest shock and descend to simpler compounds. Life, and the sexual passion as its highest point, may thus be compared to a fountain, in which the water rises to a certain point,¹ falls over, and breaks up in every direction. The point of highest vitality is just before the beginning of decadence. The period of reproduction is the highest point of the curve, in which the anabolic and katabolic conditions are closely correlative, and are almost indistinguishably passing, one into the other. The anabolic is, however, more fundamental, and a pre-supposi-

¹Cf. article on "Physiology," Ency. Brit.

tion of the latter. Accordingly, the male who is normally katabolic is just one step in advance of the female, who represents more persistently the inheritance of the race. Conversely, with the female, a more katabolic condition is always possible. We accordingly see, even among species when the male normally courts, instances when the female shows her ability to play a katabolic rôle, which has not been heretofore used by herself or her female ancestors. At the reproductive crisis, the female is just about to pass into the disruptive and explosive condition in which the male is, normally, already found.

Fear, a characteristic female emotion, becomes anger in the male diathesis. When fear and anger do not rise to a complete discharge in their own field of activity, like any outcome of nutrition, they fill up and strengthen the sexual passion, which flourishes only as it is able to absorb, use up, or overcome their fundamental energy. Without a certain preliminary erethism of fear followed often by anger, the sex potential could not rise to the height to which it does, and there would be less likelihood of the old hereditary channels being filled up and rendered productive in the sexual excitement, and less opportunity for the margin which results in sexual selection.¹ The examples of animal courting already given, and the more extended irradiated courting of phallicism, are evidence of these facts, and we have further confirmation of them in the phenomena of perversion.

The greater similarity of constitution of the two sexes in the sexual culmination, helps to account for their mental as well as physical *rapport*. The female is morally and mentally impregnated as well as physically by the superior energy of the male, just because she is on the point of passing into the energetic state herself, and, under certain circumstances, actually does so first. This also helps to account for the carrying out of selection on the part of the females. The female understands and appreciates the excitement of the male because there is already a similar tendency in herself. But while the constitutional symptoms are traveling in the same direction, the advanced condition of the male causes a difference at any given moment in the more representative or intellectual parts of the psychic states peculiar to each. With the lower animals, for example, the male reacts more quickly to the stimuli of food and climate and thus comes into heat sooner than the female. The periodic tension of the semen in man is to be regarded as a comparable hereditary

¹ Compare what has already been said under the head of Fear and Anger.

expression of these seasonal stimuli. The phantasy of the male seems to be more closely connected with his somatic condition, and under the influence of his stronger passions issues more quickly in a motor discharge. He therefore shows less calculation or selection, and is below the female in merely intellectual ability. It is a matter of frequent observation that men more frequently than women throw themselves away in a union beneath them.

The female, on the other hand, at the beginning of courting has before her the excitement of the male, which is interesting to her because she is approaching the same condition herself. There must, therefore, be a mental representation or imagination which re-echoes her own dawning emotion, but which is some degree in advance of it. This is in terms of the excitement of the male, which becomes the symbol for, and expresses the meaning of, her rising emotion. So, in sexual intercourse, the pleasure of the female may be largely the echo of that of the male, and yet her pleasure be none the less real. This has sometimes been referred to as sacrifice, but, if so, it is as amenable to the pleasure law as anything else. Here comes in the pleasure that is taken in pain. In many cases a woman loves to be hurt in a sexual relationship, if there are thus awakened representations of pleasure, often in terms of what is seen or felt as belonging to another, but which serve nevertheless, in normal cases, to awaken the inward movement which results in her katabolic climax. The initial stages of courting come, then, by association to draw the others into activity. They have a meaning, become symbolical, and may be fetichistic, as, for example, are the particular points, peacocks' spots, ball and socket ornaments, etc., so finely discriminated and emphasized in sexual selection. With the most of species this fetichism runs towards increasing the beauty and splendor of the male. Such a tendency is deeply rooted in the constitution of women, although the emphasis here, as we should expect in the human race, is moral and psychic as well as physical. The women of the Samogyan States do not believe they are loved by their husbands until they have received a box upon the ears.¹ In parts of Russia the woman collects and keeps in order the rods with which she is beaten. A stranger marrying a woman of this race found her unsatisfied and complaining to him that he did not love her. She requested him to beat her, after which she was contented and happy. Michelet² says in effect that in the first years of marriage, the young girl looks

¹ Kraft-Ebing, "Psychopathia sexualis," 7th ed., p. 140.

² "L'Amour."

to her lover to develop her love and mould her life. In this period he lays up permanently in her character a part of himself, which will react on him in later life when he comes to depend on her more as nurse and friend. The Provençal burden (translated by Swinburne) shows a similar trend:

"Nay, slay me now; nay, for I will be slain,
Pluck thy red pleasure from the teeth of pain,
Break down thy vine ere yet grape-gatherers prune,
Slay me ere day can slay desire again!
Ah God, ah God, that day should be so soon!"

And Browning in a higher sphere of feeling:

"Be a god and hold'me
With a charm!
Be a man and fold me
With thine arm!

Teach me, only teach Love!
As I ought,
I will speak thy speech, Love,
Think thy thought—

Meet, if thou require it,
Both demands,
Laying flesh and spirit
In thy hands."

It is in line with this phase of the psychology of woman, and in consequence of the physical attractiveness being largely left to her, that objects which excite a man's desire are often, if not generally, the same as those affecting woman. The female body has a sexually stimulating effect upon both sexes. Statues of female forms are more liable than those of male forms to have a stimulating effect upon women as well as men. In phallicism, says Rosenbaum,¹ the Lingam is an expression of male egoism and not physically attractive to either sex. The evidence of numerous literary expressions seems to show that under the influence of sexual excitement a woman regards her body as made for man's gratification, and that it is this complex emotion which forms the initial stage, at least, of her own pleasure. Her body is the symbol for her partner and indirectly for her, through his admiration of it, of their mutual joy and satisfaction. If a fixed idea or cramp should occur in this part of her phantasy, we would have a perversion similar to Masochism.

Corresponding to these features in the female, we find an unreflecting and active diathesis in the male. With the lower animals there is frank and undisguised display of their beauty

¹"Geschichte der Lustseuche im Alterthum."

and prowess, a masterfulness which frequently amounts to cruelty. There is rarely, if ever, docility; as an attraction it would be wasted on the female. In man this is still the deepest tendency, and when fetichistic is evidently the basis of Sadism.

These characteristics of male and female courting tendencies are fundamental and form what might be called the first or primary law of courting, viz. :—

I. The male is physically active, but non-reflective, the female is passive, but imaginatively attentive to the states of the excited male.

Built upon this, however, and not really contradicting it, in some species, and in man particularly, there comes to be slighter tendencies in both sexes of an opposite nature. This is sometimes expressed by saying that men are becoming more like women, women more like men. This possibly may occur by way of degradation, but there is also a normal movement, involving a higher development, which arrives at a superficial resemblance at least.

With the restrictions of civilization, an imaginative radiation is greatly favored. Before marriage the woman begins to be hedged about. It is regarded as right that she, or her parents for her, should have the option of whom she shall know. Before the introduction, and in her general appearance afterwards, she spares no pains in making herself attractive, appealing to the taste of men in her manner, style, and dress. If the fashions originate with the Parisian demi-monde, as Moll says,¹ there must be here a distinct appeal to the sexual taste. Woman comes to occupy the first stages of attraction, and to specialize on the physical aspects of beauty as being less important to the peculiar character of the human race.

Corresponding to this there is less physical activity, relatively at least, on the part of the male. The larger mental capacity, as well as the restrictions of civilization, favor the development of his representative powers. He comes to imagine how the woman feels, and becomes submissive and docile, waiting for the initiative of some one else. Chivalry becomes developed. Self-repression is necessitated. Fashionable society, with its delicate appreciation of manners, or good form, lives almost entirely in this sphere. All this is simply an evidence of a highly developed condition, which, irradiating into other departments, makes the difference between the savage and the cultivated man. In sexual congress itself, the increased representative powers of man make a dif-

¹Cont. Sex. Empfind., p. 148.

ference. He has already passed through the relatively anabolic state, and knows by recent experience to what it leads. He is intellectually interested in its development, and the states of the female come to be, reflectively, the symbol and outward record or expression of his passion. To see and feel these secondary signs of emotion, to the more intellectual at least, are often of the greatest importance, and may even become, abnormally, so dissociated as to afford the whole means of gratification, instances of which we see in Masochism and inversion in men.

Data like the foregoing give us the material for a secondary law of courting, which normally operates only as an accessory of the first, viz.:

II. The female develops a superadded activity, the male becoming relatively passive and imaginatively attentive to the psychical and bodily states of the female.

In the operation of these laws in the life of love, both in the large rhythm of a whole life and in the shorter wave of a single sexual passion, the secondary tendency of both sexes acts as if it were marginal at the end as well as at the beginning, as in the flow and ebb of the tide, and with each of its waves, the water passes over the same ground twice. When the primary tendencies and the central sexual functions are exhausted, the more irradiated portions have had time to recuperate. The true, or at least the highly developed lover does not push away his mistress as he would the walnuts and the wine. He has an increased sympathy with her, and is more at her disposal than before. He occupies for a time the more feminine attitude characteristic of the secondary law in man. The same thing is true of advancing age and of the approach to maturity, the secondary or more highly irradiated tendency is more active in both. When r , r^1 , etc., is exhausted or not yet active, the more irradiated portions absorb the nourishment (see Fig. 4). In the child the irradiated imaginative portions of the sexual system, corresponding to appreciation of art and nature, are in partial operation at least, before the advent of physical capacity.

Since in the full operation of the sexual passion the primary tendency is normally stronger, it follows that the male and female are not on equal terms. As a result of her greater coolness, selection falls naturally to the female, but it is like the selection of a guide to an unknown country, whom she must trust implicitly and follow blindly. Man is naturally more responsible than woman for the outcome of the sexual passion and all that depends upon it, and should be more the master and the guardian of woman's virtue and welfare than she can possibly be herself. It is an instinct of cowardice

that permits to woman equal rights, and, therefore, equal responsibilities in such a matter.

It is in line with this that man has for thousands of years been selected sexually, largely for his practical capacity, his active and moral powers, his sense of responsibility, than for his beauty. It is his capacity to admire, not coldly, the beautiful in woman, an active power, rather than his presentation of it himself, which is gratifying to woman and is normally selected by her. As Jennings says, the beauty which attracts sensually even women must be of the feminine order. Man rather than woman is the typical artist, since the production of art implies active admiration, although its appreciation quite consistently belongs more peculiarly to woman.

One thing remains to be said, which, if space permitted, should be more completely dealt with. If woman is the divinity of human love, it yet must be *one* woman who is the symbol of this faith. This is not merely a restriction of morality, but an outcome of desire. The widened consciousness of man demands it. He is now capable of taking in his whole life in one far-reaching impression. He is no longer merely the creature of the seasons. He does to-day what he knows will bear fruit in years to come. He feels that it is a paltry life that is made up of repetitions. So in love, he chooses forever, for better or for worse. Along with this comes a widening in the character of woman. She is no longer without a soul, as the polygamist believes. She becomes capable of development, so that, as the Greeks suggested in the story of Peleus and Thetis, in one woman a man marries the changing variety of the race. The advance of humanity towards monogamy has been an incomplete expression of this desire. The repetition of initial stages, as with polygamists, legal and otherwise, give no real development. The meaning of the world, and of love its best solution, is never reached or even named. The love of the modern man demands its systematization¹ in a single individual, who may become a symbol more than a complete realization both to herself and her partner of the mystery of love and the consequent enlargement and uplifting of all humanity.

With normal individuals it is, of course, the proper interrelationship of the courting laws that is the important feature. The *beau idéal* of a manly character, for example, is sometimes expressed by the phrase, "the iron hand in the velvet glove." Such a conception represents the harmonious operation of the courting laws, which, in a high state of civilization, are to be looked for in almost every department of life.

¹ Cf. Gaston Danville, "Psy. de l'Amour," and Max Dessoir in "Zur Psychologie der Vita Sexualis," in *Zeitschrift für Psychiatrie*, Bd. 50.

Degeneration. The phenomena of decadent sexual life indicate, no less than the history of irradiation in the past, its great range and complexity, its consequent plasticity, and its preëminent liability to injury and failure. A comparatively slight change, such as that involved in domestication, shows itself first, both in plants and animals, in the decadence of the sexual functions. This is in harmony with the fact that these functions occur only when the individual has come to maturity, and that they are, during this period, the expression of a metabolism which has arrived at its highest condition, and is thus ready to become kinetic and productive. It is evidently an advantage for both the individual and the race that the sexual functions should occupy such a position, and that reproduction should be the result of the highest individual vitality.

We have already seen that the superior organs of the genital system and their nervous attachments stand between the fundamental reproductive organs and the general system. Goltz shows that with frogs, after the ablation of the hemispheres, this centre is in the receptacules seminales and not in the testes. Where a rutting season is not found, as is the case with man, this tension must play a more subordinate rôle, although even here, with numbness of the higher centres, the lower will occupy their place. The sexual system in man is so much more highly irradiated and more complex that a term in that system considerably higher up would be the natural point of connection between it and the rest of the organism. It appears to the present writer that this pivot has come to be in man entirely psychical, and that it must be identified in a general way with what is commonly called the imagination, meaning by this no mysterious faculty, but simply the higher, more representative and symbolic reactions not directly connected with nutrition. We have already observed among the lower animals traces of the evolution of this phantasy. At first touch, then smell, then the higher, more symbolic sensations of sight and hearing, and finally mental representations, are the means used for bringing the sexes together at pairing time. In man, the imagination comes to be the normal organ of stimulation, with the full and free operation of which pleasure is intimately connected. It is, moreover, by means of this channel that the distantly connected activities of the body as a whole are called into the liveliest exercise.

It is, nevertheless, a very natural thing that the somatic sensations of the sexual passion, the thrill of pleasure that really belongs to the whole body, should be ordinarily objectivized and focused upon the already heightened

sensations of the particular sexual organs. Cases of priapism, however, show that the mere sensations of the surface are insufficient to give pleasure. The ejaculation centres must also be brought into play. But even when the spinal genital centres operate harmoniously and the sexual act is completely carried out, there still may be lack of pleasure and satisfaction. There may even arise disgust and misery. In such cases, very often the general somatic stimulus has been small; the heart beat, the thrill, the intoxication has been wanting, which, when it occurs, no doubt also increases the particular sensibility of the special sexual organs. Cases, however, present themselves plentifully, especially in the clinical literature of this subject, where pleasure of the most profound somatic character is experienced without any direct stimulation of the sexual organs whatever; where there is even a horror of coition, which is looked on as a beastly and degraded act. The pleasure here is often objectivized and focused upon some other sensation, at times apparently remote from those of sex. Sensations in different parts of the body, amounting often to pain, or the touch, odor, sight, sound, or imagination of various objects, serve to stimulate and carry into activity the whole force of the sexual passion. In the most of such cases, the history of these focalized sensations shows that they are in themselves originally indifferent, and only assume the importance they have, because they have been brought into contact, often at an early age, with the more somatic experiences to which they refer.

Unfortunate cases in normal life give evidence of the same character. Sexual union without exalted love or without the highest degree of love of which the individual is capable, such as may occur in prostitution or in loveless marriages, must leave a feeling of disgrace and dissatisfaction. The sexual organs may be exhausted, but the brain remains untouched. An irritation, founded on a deep longing for the discharge of these higher functions, remains—a sadness and sometimes anger supervenes, which, in morbid cases, may rise to an uncontrollable degree. The best of women, through the various arts in which they are frequently skilled—music, dancing, conversation, and the play of finished manners and address—have known how to call into healthy function the subtle but persistent irradiations of the sexual passion. When the imagination is touched, the heart is opened up, and the whole soul and body respond to their utmost depths. It is under this rebus that we should place the desire for a strong sensation, either given or received. The slightest sensations seem strong under profound somatic

excitement, since they are the outer focus, and therefore the expression of the whole condition. In order to repeat this pleasure, the individual desires again its objective expression, which appears to him the important part of the condition. The fact that this does actually tend to produce the pleasure sought for, is no evidence that the sensation has had a mechanical and assured effect like that of heat or light or sound. Its suggestibility may fully account for all the consequences.

Perversion. There are four natural groups into which the perversions, described for the first time in the clinical literature of the last ten years, naturally fall, namely fetichism, Sadism, Masochism, and inversion. These are, however, merely empirical divisions, and are by no means exclusive. Krafft-Ebing makes fetichism include cases when the sexual passion is focused upon some material object, some article of clothing, or some part of the body. The body itself, however, if the sexual passion be limited to that, may surely be as fetichistic as any part of it. From a psychological point of view, it is the narrowing of the means of representation and the exclusion of more adequate means of symbolism that makes the fetichist, who is thus, as Krafft-Ebing says, a monster by defect. The defect, however, is in the symbolism and not in the feeling which it awakens, for hyperæsthesia is almost a constant accompaniment of all such perversions. Fetichism is properly the failure of the intellectual or symbolical side, which is characteristic to a greater or less degree of all. The class to which the term fetichism is ordinarily limited is simply that in which this side is comparatively more prominent; Sadism, Masochism and inversion are also fetichistic.¹

When the fetich is an object, it is most frequently some article of clothing or connected therewith, the naked body having sometimes an inhibitive effect. Binet² describes a case where the object of desire and the only stimulus to sexual excitement were the nails in the soles of a lady's shoes. Velvet and fur are frequently fetichistic, a fact which indicates the connection of sexual feeling with sensations of touch. Odors also have in some cases a very powerful sexual stimulus. The most frequent fetiches, however, are those which depend upon the sense of sight. Handkerchiefs and white underclothing are frequent fetiches of clothing. The parts of the body most commonly fetichistic are the eye, the hair, the hand and the foot. These are the parts that are most ordinarily exposed, and will therefore be most likely to stamp them-

¹Cf. paragraph on symbolism and fetichism.

²*Revue Philosophique*, July to Dec., 1887, "Le Fetichisme dans l'Amour."

selves upon the phantasy under conditions of sexual emotion.

Mental characteristics may become fetichistic. J. J. Rousseau's case is a classic example.¹ Bodily defects even become attractive. Des Cartes' preference for squint-eyed women is an instance. Dr. Lydston of Chicago² gives a case of a man who, after a liaison with a woman with an amputated leg, was satisfied only with others having the same defect. The time of the day may become fetichistic. Garnier³ gives a case where, on account of early associations, coition was impossible except in the morning. Even attraction for an individual may be fetichistic, and may be felt to be degrading, although too powerful to shake off. Daudet, in his novel "Sappho," makes a very suggestive study of this feature of illicit love.

Next to the general neurasthenic diathesis, which lies at the basis of all perversion, and the morbid working of the phantasy, perhaps the best marked characteristic of fetichism is the existence of a second life,⁴ a segmented or divided self which may be colored by sexual love, but unable to come to fruition in the sexual act, or if so, with a diminished amount of pleasurable feeling. The reactions excluded or cut off from the stimulus of sexual gratification still keep up for a time an independent existence. Krafft-Ebing's Obs. 44, 45, 46, 47, 48, 49, 50, 53, 54, 60, 64, 76, 86, 108, 109, 110 and many others give evidence of this division. Obs. 44 gives a typical example of a pervert, in whom the reception of blows and wounds played a good part in his sexually-colored imagination, while he often had the most enthusiastic inclination for young girls of his acquaintance, but not connecting this in any way with his sensuous thoughts. In his dreams, also, these two circles of erotic presentations never mingled. Both spheres were for him a kind of *poésie*, but they remained two separate worlds.

The lack of coincidence of desire and pleasure has been frequently noted, and is an evidence of a form of segmentation. Dr. Mathews Duncan⁵ describes this condition as very common with women. With fetichists, as with normal individuals, desire may be exhausted without pleasure, which is dependent, as most of these cases show, upon the suitable stimulus of the sensuous phantasy. Krafft-Ebing's Obs. 86⁶ is illustrative. The alternation of waking and sleeping also

¹ See his "Confessions," and Binet, *op. cit.*

² Lecture on Sex Perversions.

³ "Anomalies Sexuelles."

⁴ Cf. Pamphlet by Dr. Moritz Benedikt on "Second Life."

⁵ "Sterility in Woman."

⁶ *Op. cit.*

bears upon segmentation. The functions of the brain when dreaming, although connected with the waking life, have a considerable degree of independence. This is doubtless due to the fact that the higher centres are not in full control. There comes thus to be formed a sort of second self, a quasi-personality, to which the sex functions particularly become relegated. The normal form of this connection is indicated in emissions accompanied with dreams.

The presence of dreams is regarded generally by physicians as a sign of health. Dreamless emissions are on the road to become dangerous, leading to emissions without erections, and showing a weakening of the psycho-physical connections of the sexual apparatus. The subconscious region, which controls the dreams, comes into play in sexual congress and is normally led by the higher centres. If it is then properly fatigued, it is not aroused for some time in dreams. There are several cases that show that when these psychic centres are not so fatigued, emissions may occur very shortly after coition.

A collection of erotic dreams made by the present writer, from a number of normal individuals, indicates that dreams accompanying emissions are frequently Sadistic, Masochistic or inverted in character. Such dreams under unhealthy nutritive conditions might become the starting point of fetichisms of different kinds. They might more readily lend themselves to fetichisms where coitus is unnecessary, as in emissions the male organ is without the stimulus of contact. It would seem that this source might favor inversions particularly, since the imagination here still uses a whole person, although it fails to involve those higher ranges which are concerned with future generations and the destiny of mankind, and those deeper and more intensive hereditary æsthetic feelings which are associated with the presentation of the female sex. Wide somatic reverberations or complete erethism must be absent during sleep.¹

The fact that hypnotism has been the most successful agent in the treatment of cases of perversion, shows the importance of the underlying or divided-off part of the personality, and the danger in not recognizing it, developing it, and bringing it into connection with the normal life.

Leaving the consideration of the more intellectual or formal side, let us turn to those perversions where the kind of feeling is the important feature, and where the fetichistic object or action may vary considerably with the same individual so long as it serves to focus the abnormal emotional condition.

¹ Cf. Mercier in "Discussion on Imperative Ideas," *Brain*, 1895.

As we saw in studying the sexual habits of the lower animals, courting and combat are the constant preliminaries to sexual gratification. These shade into one another, courting tending to take the place of the more basal form of combat. The passions which thus come to be associated with love are those of fear and anger, both of which, by arousing the whole nature and stimulating the nutritive sources from which they flow, come to increase the force of the sexual passion to which they lead up and in which they culminate and are absorbed. Even here we saw traces, as with the woodgrouse's cruelty to his mate, of the morbid or excessive action of these underlying passions, evidences that they had not been completely overcome, that love had not been sufficient to cast out fear and anger. In the more emotional perversions of Sadism and Masochism, we find a relapse to these primitive passions. In Sadism¹ we find this special toning of the emotions to run in the direction of anger. The fetichists here are active and often violent. In Masochism² the opposite condition is found. Fear or related emotions, a sense of being mastered and a delight in it, are the general features. To these are to be added various forms which are related to one or the other of these salient classes.

As already indicated, the relapse to the underlying passions of fear and anger is accompanied with and sometimes caused by fixed ideas or fetichisms in the primary or secondary courting tendencies. Masochism in women is rare; even fewer cases are reported than of Sadism. This is in harmony with the normal Masochistic tendency of women. Masochism in men, on account, perhaps, of the greater difficulty in bringing it into contact with the actualities of life and the consequent imaginative concentration, offers very many cases. It is, moreover, from the representative side, connected with a fault in the secondary courting tendency which embraces more highly irradiated and therefore less firmly established reactions.

Masochism, as many of the cases show, occurs along with its apparent contrary, Sadism. It seems quite possible that an originally Masochistic feeling might pass into a certain degree of Sadism. Under the action of the secondary courting tendency, a man comes to speculate on and to dwell upon representations of the woman's sexual states. What he first observes would naturally be reactions of her secondary tendency, but his penetration might discover, or chance might place in his way the observation, that many women love to

¹ So called from the notorious Marquis de Sade.

² From Sacher Masoch, the author of "*Venus in Furs*."

be ruled and even humiliated, so that from a Masochistic motive he might become somewhat Sadistic at least.

Sadism in women ought to be connected with a more irradiated portion of the imagination than in men. In the preliminary anger scenes in the lower animals, the female is taken up mostly with observing and watching the cruel activities of the males. Known cases of female Sadism are few, but support this idea.

History presents some terrible examples of Sadistic passion. Nero, Tiberius, and the famous Marquis Gilles de Rays, who, during the space of eight years, tortured, violated, and killed, over 800 children, are classic examples. The latter monster declared that these acts gave him inexplicable happiness. He burnt the bodies and kept a few of the prettiest heads as tokens.

Sadistic fetichism in men offers the reverse of almost every kind of act to be observed in Masochism, although the proportion of symbolic acts seems less, and those involving the direct contact of the desired experience greater than in the former class, a fact in harmony with Sadism being a perversion of the primary courting law.

* Inversion, or contrary sexual sensation, is a perversion which crosses all of the previous classes, but among the published cases at least, leans more to the passive or Masochistic form. This coincides with what is known of the peculiar societies of inverters. Coffee-clatches, where the members dress themselves with aprons, etc., and knit, gossip and crochet; balls, where men adopt the ladies' evening dress, are well known in Europe. "The Fairies" of New York are said to be a similar secret organization. The avocations which inverters follow are frequently feminine in their nature. They are fond of the actor's life, and particularly that of the comedian requiring the dressing in female attire, and the singing in imitation of a female voice, in which they often excel.

Raffalovich,¹ however, suggests that the cases that are described are morally the weakest, and correspond more closely to the female character. He thinks there is another more masculine although less known class, who prefer to inhibit their sexuality rather than gratify it in a way which, although natural to them, is at variance with the best instincts of humanity. "As men they love men, but they affirm that if they were women, they would love women." He thinks that here "we shall find ourselves in the presence of a new class adapted for celibacy, for study, for religion (since the realiza-

¹"Uranism," *Journal of Comp. Neurology*, March, 1895.

tion of their desires is not of this world). Like the ideal physician of Plato, the best of them will be of sufficiently weak character to understand the sins of their fellows, and of sufficient strength of will to make themselves useful." Max Dessoir reports a case somewhat corresponding to this conception.¹

Some of the cases that have been called inversions are evidently part of a profound degeneration of the whole constitution. The physical characteristics are sometimes so ambiguous that it is impossible to decide from the outer form or observation of the genitalia, whether the individual is male or female. Such cases, however, generally have their feelings in harmony with their real sex, and at other times relapse to a neutral and unsexed condition of feeling rather than to a state of inversion. The virago is generally of this character, the loss of femininity, growth of hair, etc., being more like the changes that follow the menopause.

In the most of the cases of known inversion, however, in which too the physical form is perfectly normal although the desires are generally female or passive, the imagination or sensuous phantasm seems to form the turning point of this part of their nature. As in normal life, especially with the young, after reading a novel the characters sometimes float before the mind as real persons, but at other times, by dint of a strong imagination, the reader picks up the very state of mind and character of the hero or heroine portrayed and acts it out in his own life, until he insensibly becomes the character represented as far as he is able to understand and imitate it. So, with an early awakening of the sexual passion, which comes in first in childhood through its most irradiated terms, it might be expected that a boy who either associates too much with girls, or who is excluded entirely from their society, might be led to make many representations to himself of their state of mind and feeling as well as the condition of their bodies while he is still too young to connect this with sexual realities, or, in some cases, to imagine them as physically different to himself. This would be a condition of hyperæsthesia of the secondary courting tendency, and might easily lead to a fetishism or fixed idea in this region. Such inversion would thus, as Ribot also claims of all real inversion, begin from above.

There are many cases which support this view, but Krafft-Ebing's Obs. 99² is an exceptionally interesting one, because it shows the development of a case of inversion from almost

¹"Zur Psychologie der Vita Sexualis."

²*Op. cit.*

a normal condition to abhorrence of coition and even illusion of contrary sexual sensation. The case is autobiographical, and many of the feelings described are certainly not of the kind which would be likely to come to consciousness in a woman's mind, but which a man might very readily imagine a woman to have.

A case of inversion observed by the present writer at the Worcester Asylum for the Insane (under the direction of Pres. Hall, and by permission of Dr. Quinby, the superintendent), indicated the same anxiety to regard himself and to be regarded in a feminine attitude.

Ecstasy. The state of ecstasy as involving an emotional condition accompanying the operation of the phantasy is the connecting link between sex and art. Ecstasy is related, as Mantegazza points out,¹ on the one side to hypnotism, on the other to narcosis, although it is a condition more exalted than either. The morbid sex states, particularly, show their connection with hypnotism, and there is a similarity between the sex states generally and the class of phenomena Havelock Ellis² groups as hypnotic, including here somnambulism, hypnotism, ecstasy, trance, and catalepsy. These are all characterized, says he, by a decreased control of the higher nervous centres, and an increased activity of the lower. This may be admitted as true, relatively at least, of a certain stage, generally the climax of these states, but before this is reached the operation of the higher centres forms a necessary prelude. The fact that the hypnotic subject must be willing, with some very few exceptions, to receive treatment, the difficulty or impossibility of hypnotizing idiots, and the increasing possibility of hypnotic phenomena, as we ascend the animal series, show that in some way the higher centres are an important factor. This is particularly true of the more impressionable stages. Moll³ says there is no suggestion without consciousness. Epilepsy, which is related to these states, begins, as the aura indicates, in the higher centres, advances, apparently, to a cramp among the motor cells of the cerebrum, and from there affects the whole motor system, which otherwise may not be diseased. Catalepsy, which presents an exaggeration of the muscular contractions common to all these states, has been explained as an exceedingly rapid series of innervating shocks from a lower centre, unable at the time to be checked by the inhibition of a higher one, in which case the process must go on until the lower centre is exhausted. Rieger⁴ shows by tracings that those in a hypnotic state are

¹"Die Ekstasen der Menschen." ²"Hypnotism."

³"Man and Woman," p. 258.

⁴"Der Hypnotismus," June, 1884.

more capable of continuing a contraction, keeping the arm extended, for example, at a certain point, but that the oscillations which indicate a loss of higher control or power of adjustment are greater than in normal subjects. Dr. G. Stanley Hall¹ shows that the reaction time in a hypnotic condition is more rapid than with normal subjects.

Generally speaking, it is thus a characteristic of these states that the associational processes are diminished in number and delicacy, but that those that do exist are more prominent and act more fatally than with normal people. The climax of these states is obsessional, but they involve a marginal associational activity of greater or less duration.

With repetition, as with fetichisms generally, a certain association becomes more firmly fixed, and the obsessional state more rapidly reached. Dr. Rieger found that a patient hypnotized by gazing at a pencil was afterwards more easily hypnotized by the use of a pencil than otherwise. With patients not well habituated, all distracting associations must be guarded against; the slightest noise, as the closing of a door, is sufficient to delay the desired effect. There seems to be a period when these stray stimuli have a much more than ordinary effect, as, indeed, with normal people on going to sleep.

Imperative ideas, or fragments of the phantasy, act in a similar manner.² The sex act in many animals may be compared with these states. Where the prodromal stage is extended, we have fascination similar to that of hypnotism; when cut short, as with the rabbit, it is most like an epileptic fit. The woodcock, described in the section on courting, after alighting, and before balzing begins, appears to be hyperæsthetic to all disturbing noises, but later on is not frightened even at the report of fire-arms. With the females in most cases the prodromal stage is more than ordinarily well marked. It is, as we have seen, the period of selection, in which the higher senses and the brain receive their highest stimulation. It is the symbol forming stage. Sensations of sight and hearing come to be symbolic or representative of those of touch and inner bodily feeling, and the higher, more complicated operations of the phantasy for all that exists below it.³

As the argument of these pages attempts to indicate, the somatic resonance of art is sex. The art psychosis is primarily an irradiation of sex, but when firmly established in the

¹ *Mind*, No. XXX.

² Cf. Hughlings, Jackson, Savage, *et. al.*, in "Discussion on Imperative Ideas" in *Brain*, 1895.

³ Recent investigations on circulation in the brain connect higher arterial pressure with diminished capillary circulation. The small-

associational tracts to which it belongs, it may act more independently, and thus become an inhibitory agent, protecting and blocking the way between the external stimulus and the underlying hereditary reactions. This depends upon the extension of the associational stage, which must not be regarded as entirely impartial or indifferent, but as being extended by means of irradiation from the more frequently occurring events to those more rarely used.

There are two conditions which will permit the penetration of this region. Normally, when the associational tracts are completely occupied or surcharged by stimuli of various kinds, any additional stimulus will break through and lead to a discharge along the more deeply seated hereditary centres. Any exceptional erethism of the brain, as in reading or composing, where the associational tracts are mainly involved, puts the individual in a more susceptible condition. Involuntary emissions during sleep are frequently precipitated by such a previously erectile brain condition, even when the mental content has been entirely neutral from a sexual standpoint. The sentimental conditions generally (associational) are prodromal to sexual states. Grief, essentially an affection of the associational tracts, with a comparatively shallow, although persistent, somatic resonance, which, moreover, is generally connected with love, frequently favors sexual attachments. Other things being equal, the more intellectual an individual is, the more difficulty there will be in filling these associational tracts. His choice will be more discriminating and refined. As he becomes older, with the waning of the unused or less used somatic reactions and the increase of associational power, he will be still harder to please, or, in other words, the associational tracts will be harder to fill.

The second condition is where the associational tract is worn down by repetition or too early use, and the path is thus made easy for discharge to the lower centres. This we find with fetichists and with those given to sexual excesses generally. Here the rest of the associational tract remains unused. The fact that perversion usually begins in childhood is in harmony with this, and is evidently connected with the general law that the full complement of associational brain connections are not developed till late.

The associational tract may, of course, also be filled up from beneath, owing to the somatic stimulus of the sexual glands. This stimulus has come to be in man, as both perversions and

est capillaries which subserve the finer reactions will of course suffer first. This is in harmony with our general view as to the course which the æsthetico-sexual erethism follows in a highly developed animal, and with the succession of the courting laws.

the history of normal cases show, a highly controllable factor.

Fear and anger as associated somatic reactions will increase the width of the bodily excitement, at first lowering, and, finally, if the proper stimulus occurs, raising the sexual potential much in the same way as in the strictly associational or intellectual regions.¹

It is not to be understood that the art psychosis involves merely an intellectual surface. The associational region itself must have a certain depth. The art psychosis is essentially a state of ecstasy, with a tendency to produce a slight obsessional climax, as with sex itself and all of the hypnotic states, but it is an ecstasy in which the prodromal or associational stages are extended in proportion to the development of the art consciousness of the individual. If the art psychosis has not been developed, stimuli which ought to expend themselves in this region lead more directly to the distinctly sexual stage, as when the uneducated are confronted with the nude in art, or in the case of men who cannot look at a pretty woman without lusting after her in their hearts. The little ecstasy of art with its wide prodromal stage is, it seems, an equivalent of, and an inoculation against, the larger ecstasy of sex, a condition which normally obtains until the associational tracts are filled.

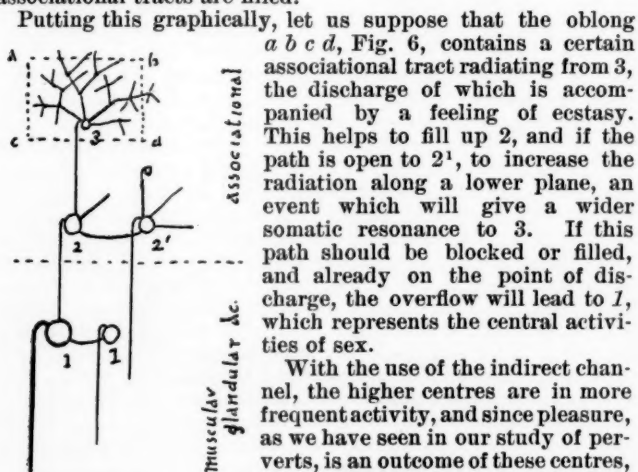


FIG. 6.

Putting this graphically, let us suppose that the oblong *a b c d*, Fig. 6, contains a certain associational tract radiating from 3, the discharge of which is accompanied by a feeling of ecstasy. This helps to fill up 2, and if the path is open to 2', to increase the radiation along a lower plane, an event which will give a wider somatic resonance to 3. If this path should be blocked or filled, and already on the point of discharge, the overflow will lead to 1, which represents the central activities of sex.

With the use of the indirect channel, the higher centres are in more frequent activity, and since pleasure, as we have seen in our study of perverts, is an outcome of these centres, the increase of the art psychosis is a gain in pleasure possibilities.²

¹ Cf. paragraph on fear and anger and Fig. 2.

² Cf. Marshall, "Pain, Pleasure and Aesthetics."

When the muscular and general glandular centres are thus called into action through the indirect channel, their activity will be of the nature of love, as the stimulus which incites them arises from a radiated portion of the sexual system. The painter's touch, the singer's note, the preacher's persuasive and passionate words, the succession of movements in a dance, the increasing intensity of drama and opera, follow the sexual curve, as does less definitely any muscular or vaso-motor activity capable of producing pleasure.

Besides the distinctly art psychosis, there are many other varieties of ecstasy that might be compared with it. Mantegazza has given a sort of natural history account of many of these. Certain forms of them, those of science, for example, seem to be a more direct irradiation of nutrition than is the art psychosis. But even these in their highest manifestations, when truth is sought for itself alone, do not differ essentially from the highest ecstasy of art.

Æsthetics. Turning briefly to the more differentiated phenomena of the art psychosis, we might notice imitation as a process which has from the time of Plato or earlier been associated with art.

The pleasure arising from putting one thing in terms of another, as we may put the world in terms of retinal color stimulation, as in painting, or in terms of natural objects, flowers, trees, etc., as in much myth and poetry, is at least part of a psychosis distinctly artistic. There is in this operation an element of the subjective or controllable, as Prof. Royce points out,¹ but underlying this there appears to be a deeper motive, or necessity of the individual constitution. Artistic imitation, if it is to have any meaning at all, belongs to a wider class, that of the formation of symbols, and is thus always more than a translation, however free. When a person imitates the movements of another for the purpose of mocking him, saying, "This is the way you do," there must be something more than the model and more than his imitative acts to account for the definite direction of his effort. This is certainly a subjective state, but it is largely uncontrollable. The observed act and the controllable deed are outward symbols of this inner and spontaneous feeling, and give what is called the meaning to both the terms compared.

The whole movement of metaphysical æsthetics has been, as Bosanquet very ably shows,² a progress from the dominance of the idea of imitation as an explanation of art to the recognition of characterization, meaning, or significance as of the

¹ *Psy. Rev.*, May, 1895.

² "History of Æsthetics," 1892.

first importance. From the metaphysical standpoint this emphasis of meaning culminates in the "idea" of Hegelism, "which is the unity of the world interpreted on the analogy of the intellect,"¹ and with certain modifications Schopenhauer's "idea" occupies a similar position. Supplementing this, and marking an advance towards psychology, Bosanquet himself offers the following conception :

I suggest as an approximate psychological definition of æsthetic enjoyment — "Pleasure in the nature of a feeling or presentation, as distinct from pleasure in its momentary or expected stimulation of the organism." Such pleasure would always, it is my belief, be connected in fact with the *significance* of the content of feeling. . . . If anything in the region of taste, smell, touch, heat, or cold has a value akin to that of beauty, it is not surely either the strongest or most delightful sensation, but rather the most suggestive sensation, or that which is most highly charged with associated ideas, so normal that we do not take them to be accidental. Not the scent of eau-de-cologne, but the smell of peat smoke, or of the sea; not the comfortable warmth of the house, but the freshness of the morning air, are sensations of a kind in which we may feel a certain disinterested delight not wholly dissimilar to æsthetic enjoyment. The merest germ of the sense of beauty seems to imply a distinctness between stimulus and significance.

It remains for psychology to identify this significance with, or at least to base it upon, hereditary affective reactions actually occurring within the organism, and which, as these pages attempt to indicate, are primarily irradiations from the region of sex.

Aristotle's theory of the drama as a representation or imitation affecting a katharsis of the passions of pity and fear, bases its operation psychologically on these deeper emotions which we have claimed as most closely connected with sex and art. From this point of view, there is much to be said in favor of regarding the drama as the typical fine art. It is, from the point of view of the material used, primarily an exploitation of movement, to which it adds all the higher sensuous and intellectual pleasures. The courting scenes of the lower animals are essentially dramatic. The early festivals and phallic ceremonies of lower races centre around dancing and the drama. Music and poetry plainly show their derivation from movement. Painting is no more passive than any of the other arts, but implies the movement of the eye for its appreciation as well as the sympathetic intuition of the muscular movements and subtle emotions (suppressed movements) of the original artist.

With undeveloped, badly developed, or decadent art, the symbolism, normally expressive of emotional depth, and correspondingly wide and fluent, becomes fetichistic and narrow.

¹ Bosanquet, *op. cit.*, p. 304.

In students' college papers and journals, Dr. Drew¹ recently examined 356 poems. Of these, 26 were indefinite, or referred to love but incidentally; 270 made mention of particular physical charms. The features most noted were: eyes, 91 times; hair, 51; face, 24. Among the poets who referred to the face, 13 were charmed by its brightness, 4 found it sweet, only 1 noted an intelligent face. The modern French decadents and symbolists show decidedly fetichistic signs, both in their neglect of the wider scientific, social, and philosophical experience of the nineteenth century and in their arbitrary choice of words.²

Conclusion. Art, like sex, is, however, in its best conditions essentially an overflow of health and strength, an outcome of the highest metabolism of the organism. Its dynamic power is thus the most intense, its influence on the individual profound and purifying. Can education and philosophy neglect such a power?

It is to the young adolescent that its importance is greatest. On the one side we have the great passion of sex, unknown, budding, creating modifications that have well been called regenerative, a passion so plastic, so loosely knit together that the slightest accident suffices to decentralize and change the whole current of its life; on the other, vague hopes and aspirations, transcendental longings, poetic yearnings, a craving for sympathy and recognition. Shall grammar and algebra, or even the whole curriculum of the ordinary college, suffice to assuage this instinct? The "breakings out," the orgies, the sexual immoralities of student life, though less common, perhaps, among students than with other unmarried adolescents, yet indicate an overflow, a waste of energy, that mere repression, mere loading, will never curb, but rather repel when it does not destroy.

Why can not this plastic passion that underlies these manifestations be turned into channels where it may naturally flow? Does not sex itself produce its own best organ of inhibition in the love of the beautiful and works of art? Why should the best youths of our land be excluded from such a culture at an age when it would serve to engage the enthusiasm of many who are left cold by the dryness of academic literature, science, and mathematics? The history of art, a knowledge of architecture, archæology, and formal drawing, however useful in its way, does not touch the heart of the problem. These are not a natural overflow of our modern thought and feeling. The real work of art, as Taine says,³

¹ *Pedagogical Seminary*, Vol. II.

² Cf. Lombroso, "L'Homme de Genie."

³ "Phil. of Art," trans., p. 180.

"is determined by an aggregate which is the general state of the mind and the surrounding manners." "Fill your mind and heart," says Goethe, "with the ideas and sentiments of your age, and the work will follow." Art is one, and each of its branches is affected by each of the others, but there is yet a truth in Hegel's conception¹ of the movement of the centre of gravity of art among the different arts as time moves on. At the present, poetry, painting, and music have each blossomed out in distinctly modern forms. These represent the natural overflow of our age, and these most recent evolutions are the material to quicken and purify the life-blood of our youth.

It may be said that the student may find this inspiration in the professional schools of art. But these are technical schools, and should be designed to meet the needs of those who intend to make the profession of art their work of life. They stand in the same position to the college and the university as do the schools of engineering, the schools of divinity, pedagogy, law, and medicine. This does not meet the real needs of education, where culture should be followed for the sake of its ennobling and uplifting influence, for the awakening of ideal interests, for the purifying and perfecting of the highest individual capacity. The student may neither want to paint, nor play, nor write, nor may he wish to dissect formulæ, or study specimens of ancient art. What he desires is to come into real and intimate contact with the life that fills our modern art, to appreciate and enjoy, and to feel with his very heart the ecstasy of love that art forever offers at nature's shrine. It is time that the art education of this country was put upon a psychological basis, its powers and possibilities recognized and turned to service in the cause of education.

"Who does not in this period," says Krafft-Ebing, "grow enthusiastic for the sublime and beautiful, remains a Philistine for the rest of his life."²

To quote Guyau³: "Art aids in the full development of life and becomes a gymnastic of the nervous system, a gymnasium of the mind. If we do not exercise our complex organs, they will produce in us a sort of nervous plethora, followed by atrophy. Modern civilization, which multiplies capacities

¹ Cf. his "Æsthetic."

² A study of children's drawings by Earl Barnes of California shows where the interest of the pupils lies, and this is where education should be applied. The rude figures that children love to draw on their slate, often the *bête noir* of the unintelligent teacher, are really much more artistic than the cubes and squares and conventional designs which they are compelled to copy. They are, at least, expressive and sincere.

³ "Problèmes d'esthétique contemporaine," p. 10.

of all sorts, and by a true antinomy carries the division of functions to an excess, needs to compensate for this inequality by the varied play of art. Art has, then, its rôle in human evolution, and its extinction, perhaps, would mark the end. Our organism, as it improves, will come to economize more of its force, like all our machines, and in this way will always have a quantity in reserve. It is art that ought to employ the surplus of force unused by the ordinary demands of life. Art will thus double and triple our existence. A life of imagination will be superposed to that of real existence, and it is this that will irradiate the overflow of our sentiments. Art will thus be the perpetual return of all our unemployed faculties. One can conceive that art, this luxury of the imagination, might finish by becoming a necessity for all, a sort of daily bread."

Art, standing as it does between religion and philosophy, is in one sense, or in one of its stages, a criticism of life, as Matthew Arnold says of poetry. This is the most external, prodromal, or associational phase. It is in its deeper moments rather the creation of life. It gives men thoughts and experiences, and it thereby forms the experiences they already have. The artists are the makers, and are continually preëmpting the regions that have been heretofore unconscious. Says Walt Whitman, they "are not the followers of beauty, but the august masters of beauty," the "answerers," as he calls them, speaking of poets, or the makers of ideals.¹ This is the only sense in which all the arts are poetic. Painting, for example, is not poetical in proportion as it treats some literary theme, but in the proportion in which it issues categories and gives humanity a new and, perhaps, a deeper way of seeing things. A painter lends his eyes out, as Browning says, and his heart and brain as well.

It is love in its best development in a continued married life that gives us the pulse of this movement. The early periods of courting are times of intense criticism. Association and comparison are the necessary accompaniments of selection. But with a happy marriage the mind no longer has a feeling of estrangement. The stilted, formal conversation, the fear of pauses, the morbid solicitation, the critical spirit which haunts us in ordinary social contact, even when intimate and free, leave us entirely in the presence of the woman whose heart we know, and whose body and soul we love. We then become truly original, truly ourselves; thoughts come, impulse is free, creation is achieved.

The ennobling ecstasies of poetry, music, painting, and the enthusiasms generally, are at the same time an outcome of, and a substitution for this happiness.

¹ Cf. Havelock Ellis, "The New Spirit."

ON THE DEVELOPMENT OF VISUAL PERCEPTION AND ATTENTION.¹

BY HAROLD GRIFFING, PH. D.

(From the Psychological Laboratory of Columbia College.)

It is well known that a number of simultaneous impressions on the retina can be perceived when the time of exposure is so short as to exclude successive attention.² The extensive threshold, as the greatest number of objects thus seen may be called, varies with different individuals and doubtless many other conditions. The object of the experiments now to be described was to determine some of these conditions, especially those relating to the age and development of the observer. As the accuracy of perception clearly depends upon attention, I hoped also to obtain some data bearing upon the development of voluntary attention.

The apparatus used was constructed on the same principle as the gravity chronometer of Cattell and the tachistoscope of Volkmann and Wundt (see Figure 1). The objects to be perceived, which were letters, were pasted on white cardboard. This was placed on a wooden upright board. In front of this board is a movable screen of cardboard *AB*, with a rectangular opening, which, when allowed to fall past the objects, exposes them for the time taken by the opening in passing. The screen is let fall by the operator, who pulls the string attached to the clasp *M*. The noise of falling is greatly lessened by layers of felt in the screen holder *S*. The entire apparatus is hidden by a curtain *CD*, with a rectangular opening *OL*, where the stimulus *HK* appears. The

¹The experiments to be described were partially planned in conjunction with Mr. S. H. Rowe, formerly Fellow in Education, Columbia College. On account of absence in Europe, Mr. Rowe was unable to continue the research.

²For previous investigations on the subject, see Cattell, *Philosophische Studien*, III, or *Brain*, XXXI.

advantage of the curtain is that an observer is ignorant of the movement of the screen, except as he perceives the objects exposed or the white background upon which they appear. In the centre of the opening of the curtain, and attached to the curtain by thread, is a small white cross *F*, serving as a fixation point. The entire apparatus is painted black. The time of exposure in these experiments was $\frac{1}{10}$ second.¹

With this instrument the writer made a large number of experiments on school and college students, mostly from the

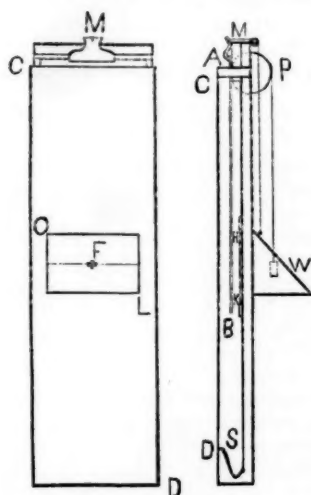


Fig. 1.

Horace Mann School of the Teachers' College and the School of Arts in Columbia College. Ten successive experiments were made on each group of observers, the number in a group varying from ten to thirty. The groups were arranged in approximately a triangular shape, so that all could see distinctly anything near the fixation point. In each experiment the stimuli were six capital letters arranged in two rows of three each, and presenting the appearance of an approximate square. The letters were printed for the purpose, and were 48 mm. in height. The combinations of letters were as fol-

¹This time was obtained theoretically from the formulæ of mechanics.

lows: (i) YOG LNA, (ii) EVX MHK, (iii) UJR ZWD, (iv) NXA GFO, (v) DRK LSI, (vi) YZB CTP, (vii) JNW HVE, (viii) TSX LFA, (ix) CDI RGK, (x) OBP UJM. They were selected so as to avoid, if possible, any decided difference in the legibility of the different groups. For this purpose I used the results obtained by Prof. Cattell for the legibility of letters.¹ In conducting the experiment the observers were told to look at the fixation point when the signal "ready" was given, and to continue to look at the fixation point until the letters appeared, when they were to write down what letters they saw. They did not know how many letters would appear, and care was taken that they could not know when to expect the stimulus. The purpose of this was to test the observer's powers of prolonged attention. If he was not attending, at least to the extent of looking at the apparatus, he could not see anything.

The fact that some observers were necessarily in more favorable positions for seeing than others may, we think, be neglected. In the experiments on three different groups those unfavorably seated had about as good records on the average as those favorably seated.

In the experiments on the college students, the first that were made, the intervals of time between the signal and the appearance of the stimuli were $\frac{1}{10}$, 1, $\frac{1}{2}$, $1\frac{1}{2}$ and $\frac{1}{4}$ minutes, and the same for the second five of the ten experiments. As the results showed no effect of fatigue, and as the writer wished to obtain some data on the subject, in the succeeding experiments on pupils of the H. M. S.² the intervals were increased, being $\frac{1}{4}$, 3, 1, 4 and 2 minutes.

I now give the results of the experiments for the different classes, I being the lowest primary of the H. M. S. The high school pupils include four groups from the H. M. S. and two private schools,³ and the college students include five groups from Barnard and Columbia Colleges.⁴

¹Cattell, *op. cit.*

²I will, for convenience, use this abbreviated form for the Horace Mann School.

³Mr. Browning's school for boys and Miss Gibbons' school for girls, both in New York.

⁴I take pleasure in here expressing my thanks to the school and college officers who have given me the opportunity to make these tests.

TABLE I.
Average Total Numbers of Letters Seen by Classes.

N.	C.	S	MV.	R.	MV.	MAX.	MIN.	$\frac{R}{S}$
22	I	8	6	3	3	17	0	.4
16	II-III	13	8	6	4	19	0	.4
12	IV	16	6	7	3	13	1	.4
17	V	18	5	14	4	22	3	.8
17	VI	22	10	12	5	25	0	.5
23	VII	19	7	14	5	23	0	.7
23	VIII	25	7	21	6	37	8	.8
84	High	30	5	23	6	47	4	.8
75	Coll.	32	6	29	6	59	11	.9

N. = number in class.

C. = class.

S. = average of total number of letters written down as seen in ten trials, six letters being given in each trial.

R. = average of total number seen correctly.

MV. = mean variation of S.'s or R.'s of the individual averages from the averages of the groups.

MAX. = maximum of total number seen correctly by any individual.

MIN. = minimum of total number seen correctly by any individual.

In table II are given the results for students classified according to age. The probable errors of the values of R. are given in the R. column, preceded by the sign \pm . The MV.'s for the R.'s only are given.

TABLE II.
Average Total Numbers of Letters Seen for Different Ages.

N.	AGE.	S.	R.	MV.	MAX.	MIN.	$\frac{R}{S}$
39	7 - 9	11	4 \pm .4	3	33	0	.4
77	10 - 12	20	13 \pm .3	3	32	0	.6
73	13 - 15	24	18 \pm .6	6	37	0	.7
132	16 ¹ +	32	27 \pm .4	6	59	8	.8

¹Most of these observers were from 16 to 18 years of age.

From the above tables it is evident that the extensive threshold, or ability to receive and retain¹ a number of simultaneous, retinal impressions, is a function of individual growth, reaching its maximum only when the observer is fully developed.² The average number seen correctly in one trial by the adult observers was about three, whereas children from 7 to 9 saw but one. These numbers would be less if the element of chance were eliminated.³ They would, on the other hand, probably be somewhat greater under more favorable conditions. In my experiments the observers did not know just when to expect the exposure, and, moreover, we must not expect such experiments to give results as exact as those of the laboratory. Practice increases the extensive threshold, and, as is shown by the columns MV. MAX. and MIN., great individual variations were observed. Very few adult observers saw five letters on the average, and some adults saw but two. The tendency to guess seems to decrease with maturity. The average mean variations of the separate observations of the individual observers from their averages were found to be about the same for the younger as for the older students. But the relative variation ($\frac{m_v}{x}$) for the children of 10 to 12 was found to be about double that of the students of 16 and over. This is what we should expect, as it is a matter of common observation that children are deficient in power of constant attention.

A question of considerable interest is the relation of the pupil's range of perception to his intellectual capacity as judged by his teacher. I found that those rated A for mental capacity by the teachers, on an A, B, C basis, had somewhat higher averages than the others, and out of the twelve best observers (four from each age group) eight were rated A and but one C. There are, however, marked exceptions. One young lady of 18, known by the writer to be a brilliant student, saw but sixteen letters out of the sixty, and in no case more than three. Those marked A by their teachers for attention in class also excelled the others, but here also I found decided exceptions. Many pupils must have, therefore, good powers of attention even when they show no evidence of them to their teachers. No difference was found between

¹I will use this expression hereafter in the sense in which it is here used, without making any assumption as to its psychological interpretation.

²The same result for auditory memory and attention was found by Bolton. AMERICAN JOURNAL OF PSYCHOLOGY, Vol IV, No. 3.

³The probability of correctly guessing any one letter was for the older students about one third of the probability of writing down a letter correctly as found in the experiments, and for the younger students somewhat greater.

the girls and boys, the averages closely corresponding. Other investigators have found that the girls tend slightly to excel the boys in the tests given.¹ More extended experiments might, however, show a difference.

In order to investigate the question of fatigue, the averages were taken for each of the ten experiments for each group. The results for the experiments in which long times of waiting were used, one to four minutes, were somewhat better than those in which short times were used. This was found for both series of times, $\frac{1}{2}$, 3, 1, 4 and 2 minutes, and $\frac{1}{10}$, 1, $\frac{1}{2}$, $1\frac{1}{2}$ and $\frac{1}{4}$ minutes.

But fatigue of the visual centres must have been present, since several observers complained of pain in the eyes and even headache from the strain of attention. As the results were not appreciably affected, we conclude that the attention of children may be taxed to the extent of causing abnormal fatigue without any marked effect on the accuracy of perception. As it is, moreover, improbable that the long periods of waiting are more favorable for perception, or at least so much so as is indicated, we must infer that, despite precautions to avoid this, there are decided differences in the legibility of the different groups of letters. Practice cannot account for the results for experiments V and VI, the accuracy of observation for V being about 30% and 40% greater than for VI for the two time series. Nor can we ascribe the greater legibility of V to the difference in fatigue, for, on the one hand, in the case of the H. M. S. observers, the time of waiting for V was much longer than for VI; on the other, in the case of the college students and some others, the times for both were very short.² We infer, then, that one determining factor is the arrangement of the letters. But in neither case was a syllabic combination used, and the combinations of threes certainly do not make "sense." On the other hand, YZB and CTP, the letters used for VI, have much less similarity to combinations of letters in actual use than have DRK and LSI, those used in V. If this be the explanation, the combinations are perceived as units rather than as separate and distinct objects; or at least the mind tends to perceive them so, and is successful in proportion to the ease with which the perceptive processes of the separate letters are mutually helpful. From this it would follow that we do not, as has been supposed, see several things at once, but see the given stimuli as a unit and then analyze this unit

¹Bolton, *op. cit.* Jastrow, *Educational Review*, Dec., 1891.

²The same result was found for three private school groups not here included, as the times were not the same.

into its components. It is indeed possible that since the legibility of the letters depends upon the distinctness of the retinal images, some combinations of letters may not be so favorable as others for the formation of distinct retinal images of the different letters. It is interesting to note that in other experiments in which fatigue could play but a small part, the relation of V and VI was the same as in these.¹

In the experiments described above, although verbal and syllabic combinations were avoided, several observers perceived certain combinations as words. Thus TSX LFA was read TEXAS, three times; OBP UJM was read JUMP, once; YOG LNA was read LONG, once, LONG WAY, once, and YOU, once; and UJR ZWD was read ARE, once. In a very few instances more letters were written down than were actually given. Three observers perceived the group first given as ABC, etc., the first letters of the alphabet.

A limited number of experiments were made with the same time of exposure, but with this difference, that one letter was exposed instead of six. The letters were CRYSNIXOJA. The times of waiting were $\frac{1}{20}$, $\frac{1}{10}$, $\frac{1}{5}$, $\frac{1}{4}$, and $\frac{1}{3}$ minutes for the first five, and the same for the second five. The test was made on twenty-three high school pupils and on sixteen pupils of grade II in the primary department of the H. M. S. In the 230 observations (10x23) of the high school pupils, only seven letters were written down incorrectly; and in the 160 observations of the primary class only twenty-eight were not rightly perceived. The results show that the inability of the younger children to perceive the letters when six are given is due, not merely to the brief period of exposure, but also to the complexity of the stimulus.

A few experiments were also made in which six colors were used instead of letters. As the results were approximately the same, we may conclude that the inferences based upon the tests with letters are valid for the perception of objects in general and not for letters only.

The experiments I have described were all made with $\frac{1}{10}$ second exposure. I will now describe other experiments in which the time of exposure was one second. These experiments were made only on classes I-VIII inclusive of the H. M. S. and a group of high school students. The same apparatus was used, but was of course adapted to the change of time. This was done by attaching a heavy weight *W* to a cord which ran over a friction pulley *P* and was attached to the drop screen *AB* (see Figure 1). When the screen was allowed to fall, its velocity, and consequently the time of exposure, was regulated

¹ See later experiments with one second exposure.

by the weight on the principle of Atwood's machine. The same combinations of letters were used as in the $\frac{1}{10}$ second experiments, but several months elapsed between the two series of experiments. The experiment was conducted in the same manner, but short times of waiting only were used, 5, 30, 15, 45 and 10 seconds, and the same repeated for the second 5 experiments.

In the following table, I give the results of these experiments. The letters mean the same as in table I.

TABLE III.

Average total numbers seen with 1 second exposure for different classes.

N.	C.	S.	MV.	R.	MV.	MAX.	MIN.	$\frac{R}{S}$
19	I	20	7	17	5	36	7	.85
17	II	30	5	26	4	38	20	.87
10	III	37	5	33	5	49	20	.89
20	IV	35	5	28	6	48	14	.77
15	V	40	7	36	6	43	25	.90
22	VI	44	6	38	5	54	28	.82
13	VII	51	8	44	8	58	29	.86
11	VIII	50	8	47	7	59	31	.94
10	High	59	2	55	6	60	40	.93

The results show that the range of perception for one second exposure also depends upon individual growth. The brighter students tend to excel in these as in the $\frac{1}{10}$ second tests. This was found by two distinct methods, as before. There does not seem, however, to be any close connection between the two tests. The best observers in the one second tests include many that had poor records in the previous tests. But temporary conditions would cause some variation in the same observer.

As in the $\frac{1}{10}$ second experiments, variations were found in the accuracy of perception for the different combinations of letters. As the times of waiting were very short and as close attention was not necessary in order not to miss the letters, these differences cannot be ascribed to fatigue.

The relative variation was found to be fairly constant and to be but little greater for the children of the primary classes in the

one second tests than for the high school and college students in the $\frac{1}{10}$ second tests. But the relative variation for the younger pupils is at the same time much less in the one second than in the $\frac{1}{10}$ second tests. This is what one might expect, since, when the time of exposure is as long as one second, continuous concentration of the attention is not necessary as in experiments in which short times of exposure are given.

I have up to this point endeavored to make no assumptions as to the interpretation of the experiments described. The simplest interpretation is that the extensive threshold measures the number of objects that can be simultaneously grasped by consciousness. It is probable, however, that the process is quite complex. In fact the results found for the different combinations do not favor so simple an interpretation. The accuracy of the result may depend upon the reproductive processes involved, and the analysis of the memory image. It is possible also that the sensitiveness of the retina is a determining factor.

Whatever be the exact nature of the mental process, it is certain that the accuracy of perception and reproduction will depend to some extent upon the attention. In fact Wundt identifies the extensive threshold with attention.¹ From this point of view the results of the $\frac{1}{10}$ second experiments would measure the capacity of the observers for concentrated attention. It is quite true that attention is necessary in order to see the letters, but the assumption that it is the only factor is unwarranted. The results of the experiments certainly are not favorable to such an interpretation. No decrease in the number of letters seen was found for the longest times of waiting, which were such as to cause decided fatigue. Then many bright students proved to be poor observers, and it is improbable that students that excelled in their studies would be deficient in their powers of attention. But even if we assume that the experiments measure the attention, they do not necessarily measure the *capacity* for attention. Those interested in the experiments and desiring to excel would attend more closely than others. It is possible that the general superiority of the brighter students may be due to these causes; for children of the most active minds would be most interested in novel experiences. But although we cannot assume that the average number of letters seen by an observer measures his powers of attention, the mean variation from the average of the numbers seen in the different experiments is presumably due, principally at least, to variations in the attention.

¹ Wundt's expression is "the extent of apperception," *Grundzüge d. Phys. Psy.*, IV^{te} Aufl., II, 287.

With regard to the one second experiments, the conditions are more complex than in the others, but at the same time conform more closely to those of the perceptions of ordinary experience. The number of letters seen doubtless depends upon the degree of attention, but it also depends upon the readiness with which the attention is fixed, and the time of perception. The development of the visual memory may affect the results in both series of experiments. That there is a radical difference between the processes involved is made probable by the fact that some that excelled in one test did poorly in the other.

THE "RECOGNITION-THEORY" OF PERCEPTION.

A. ALLIN, M. A., PH. D.,

Honorary Fellow in Clark University.

Paradoxically expressed, the theory under criticism asserts that to *cognize* is to *recognize*; *connaître* is *reconnaître*; *kennen* is *wiedererkennen*. Hence the name I give it—the Recognition-Theory of Perception. To be consistent, the supporters¹ of this theory can draw no distinction between perception and recognition, at least in kind. Light distinctions of grade there may be, but perception and recognition are one and the same thing; perception is recognition. First the statement of the theory, then the criticism.

THE THEORY.

"A simple process of re-cognition is involved in all cognition" (Sully). This process of cognition (perception) Sully accordingly designates "automatic assimilation or recogni-

¹The supporters of this theory are truly legion, the chief one at present being probably Prof. Höfding. Among the many may be cited Empedocles and Democritus, "Like is known by like." Kant, K. d. r. V. (Kehrbach, §127), "Es sind drei subjective Erkenntnisquellen, worauf die Möglichkeit einer Erfahrung überhaupt und Erkenntnis der Gegenstände derselben beruht: Sinn, Einbildungskraft und Apperception. . . . Der Sinn stellt die Erscheinungen empirisch in der Wahrnehmung vor, die Einbildungskraft in der Association (und Reproduction), die Apperception in dem empirischen Bewusstsein der Identität dieser reproductiven Vorstellungen mit den Erscheinungen, dadurch sie gegeben waren, mithin in der Recognition." Herbart in his "Apperceptionslehre." J. S. Mill in his edition of "James Mill's Analysis," I, 112, 113. H. Spencer, "Princ. of Psych.," I, 267, 270. Bain, "Senses and Intellect," 4th ed., 489. Sully, "The Human Mind," I, 181, 196. Wundt, "Logik," 2te Aufl., I, 17; "Physiol. Psychol.," II, 469. Ward, Ency. Brit., Art. Psych., pp. 52, 60; also articles in *Mind* on "Assimilation, etc." Höfding, "Psychologie im Umriss" (2te deutsche Aufl.), 161 ff. Vierteljahrsschrift f. wiss. Philos., XIII, 425-458; XIV, 27-40. Wundt's "Studien," VIII, 86-96.

tion." "Such assimilation is automatic or 'unconscious' in the sense that there is no separate and distinct recalling of a past sensation, and clear awareness of the relation of the present sensation to its predecessors" ("Human Mind," I, 181). We are informed that, so considered, assimilation is the necessary pre-condition of all association, thus making the Law of Contiguity secondary to the Law of Similarity.

Helmholtz writes ("Zeitschrift f. Psych. und Physiol. der Sinnesorgane," Bd. VII, Heft 2, §88): "Man pflegt als *Anschaung* eine solche Entstehung von Vorstellungen zu bezeichnen, bei denen in bewusster Weise nur der sinnliche Eindruck percipirt wird und danach die Vorstellung des Objects in das Bewusstsein springt, ohne dass weitere Zwischenglieder des Vorstellungskreises zum Bewusstsein kommen." Exner (Entwurf zu einer physiol. Erkl., etc., §234) defines the sense impression in perception as "ein lebhafter Process, der in der Rinde stattfindet, der aber keinen eigentlich psychischen Character trägt." Helmholtz, in the second edition of his "Tonempfindungen," §101, writes: "Empfindungen nennen wir die Eindrücke auf unsere Sinne, insoferne sie uns als Zustände unseres Körpers (speciell unserer Nervenapparate) zum Bewusstsein kommen; Wahrnehmungen, insoferne wir uns aus ihnen die Vorstellung äusserer Objecte bilden." I may add here that we are not conscious of sensations as states of our body or of the nerve-apparatus. *Red* is obviously the sensation red, without any reference to the retina or any part of our body; moreover we are conscious of no process by which we form a presentation of external objects out of the sensations. It is false description and bad hypothesis.

Herbert Spencer goes still further and reduces all cases of association to the one law, viz., association by similarity, at the same time making every perception a case of the law of association by similarity. His perception-theory is, therefore, the recognition-theory. "Every relation, then, like every feeling, on being presented to consciousness, associates itself with like predecessors. Knowing a relation, as well as knowing a feeling, is the assimilation of it to its past kindred; and knowing it completely is the assimilation of it to past kindred exactly like it. . . . Hence results the so-called Law of Association by Contiguity. When we analyze it, contiguity resolves itself into likeness of relation in time, or in space, or in both" ("Princ. of Psych.," I, 267). "Thus the fundamental law of association of relations, like the fundamental law of association of feelings, is that each, at the moment of presentation, aggregates with its like in past experience. The act of recognition and the act of asso-

ciation are two aspects of the same act. And the implication is that, besides this law of association, there is no other" (Ib., 270).¹

The full faith that should be in us is found in Bain: "In the perfect identity between a present and a past impression, the past is recovered and fused with the present, instantaneously and surely. So quick and unfaltering is the process that we lose sight of it altogether (!); we are scarcely made aware of the existence of a reproductive link of similarity in the chain of sequence. When I look at the full moon, I am instantly impressed with the state arising from all my former impressions of her disc added together" ("Senses and Intellect," 4th ed., 489).

Dewey adds his testimony ("Psych.," p. 180): "In perception past experiences are *wholly absorbed or lost* in the present. When we see a man we do not recognize that there are involved in this perception *all the other men* which we have seen, and that it is only through the *ideal* presence of these experiences in the present data that the latter signify to us a man. But such is the fact."

Wundt gives the following definition of assimilation, which process, according to his belief, takes place in perception: "An assimilation takes place, then, when a new presentation enters consciousness and renews or revives former presentations similar to it, and when these elements fuse to a single presentation. In this case we perceive nothing of the reproduction-process." See also "Physiol. Psych.," II, 469.

The principal exponent of this theory, however, is Höffding. He informs us that it is difficult to classify "immediate recognition," with which he identifies perception, since it is neither sensation nor idea (representation), and yet contains something of the character of both. It reminds us of the sensation, because it has for an object something present, while the idea is only a memory presentation (*Erinnerung*). "This middle position between sensation and idea, we can theoretically express by saying that in recognition both an idea as well as a sensation element is present. If we name the latter A, the former α , we can express recognition by $(A + \alpha)$ or (\hat{A}) , denoting by the brackets that we distinguish between the two elements (which in reality do not allow of being sep-

¹ *Vide* the misunderstanding in James' "Princ. of Psych.," I, 257 and 259: "Mr. Herbert Spencer has still more recently tried to construct a psychology which ignores association by similarity." Spencer somewhere says: "Were it not that the steps can be recalled, it would seem absurd to say that when the reader takes in at a glance the sentence, 'This is true,' he not only classifies each word with the before known like words, but each letter with the before known like letters."

arated) only by means of abstraction. *It can be said, then, that in recognition an idea is contained in so far as the same condition works in recognition, which in other circumstances would have been able to have led to a recall of that which has been experienced as an independent idea.* The idea contained in this way in recognition we will call an *implicate* (*gebundene*) *idea*, in contradistinction to the *free* ideas which enter consciousness as independent members of the conscious content. Recognition can be also named a memory (*Erinnerung*), but, however, an *implicate memory*, because that which one remembers does not enter consciousness as a free idea. It can also be called an *implicate comparison*, since it (the recognition) arises through similarity of the present impression with a former one, distinguishing itself, however, from the proper free comparison by the fact of the members, which were joined together by means of similarity, not making themselves felt independently in consciousness." ("Psychologie," 2te deutsche Aufl., 161-166.) Again, on page 239, he says: "This principle (principle of identity, $A = A$) corresponds to recognition, which is the presupposition of all association."

Criticism of the Theory.

After having endeavored to give the theory fully, I shall endeavor to give my objections to it in as concise a manner as possible. Some of them are objections to the false description of the facts, some to impossibilities involved in the theory, some to the unnecessary fabrication of hypotheses, and others to the lack of explanation for certain facts.

1. *Perception is not, as stated, an act of memory.* When I look upon the sun, it is the sun to me and nothing more. I do not remember all or any of the former suns which I have seen. It is the sun at once to me, and if the name is expressed upon the sight of it, it is only a case of ordinary association by contiguity. In fact, is it not impossible to experience at the same moment of time the perception and the so-called memory-image of the same object? Who can do it? If I burn myself, I know it is hot without any reference whatever at the moment to former experiences of burning. Ask me at the moment of burning if it is to me a remembrance of former burnings, or if there is any reference to past burnings, and the answer will obviously be a strongly negative one. Ask the patient whose tooth is being pulled out if the pain is a past pain, or if it has any reference to a past pain. Absurd. It is all there in the present. It is an all *here* and *now*, and the fact ought to be obvious to everybody. Repeat or read the letters of the

alphabet consciously, and how many of us have the slightest remembrance of each letter as having been seen before? And yet it is asserted by these theorists that before each letter is known there must arise first the present sensuous impression of each letter, and secondly a revived idea or memory-image (*Erinnerung*) of each which "identifies," "recognizes," or "fuses" with the sensuous impression. After this identification, recognition, or fusion, each letter respectively is known. "To cognize is to recognize; *connaître* is *reconnaître*, and *kennen* is *wiedererkennen*." Each one can repeat or read the alphabet for himself and judge of the accuracy of the theory. Spencer himself says: "To ask a man whether he remembers that the sun shines, that fire burns, that iron is hard, would be a misuse of language" (I, 456), and yet Höfding and Spencer demand a memory-element in each perception.

Höfding also asserts that in his formula of perception (A), A represents the sense-impression of the object, and a the idea- or memory-presentation. He also says the principle of identity, $A = A$, corresponds to recognition ("Psychologie," p. 239). In the perception-formula, then, $a = A$, or is identical with A ; but A is a sense-impression, therefore a is a sense-impression. Again, if they are identical, how are we to distinguish the one as a sense-impression and the other as a memory-presentation, or how are we to distinguish them at all?

Lotze says ("Metaphysik," §265): "One would not be able to know anything at all of this fact, viz., of the reproduction of a former a by the present a , if both of them were simply indistinguishable and at the same moment of time there; in order to judge of the present one as repetition of the former one, we must be in a position to distinguish them both."

Later, however, we shall learn from their own admissions that this memory element (call it *implicate* or what you will) is *unconscious*, a matter belonging to the subterranean workings of that which lies under the threshold of consciousness. If unconscious, then for us obviously it does not exist as a conscious or mental fact. To say that certain phenomena (e. g., this memory-element or these two "fusing ideas") are in consciousness at a certain given moment only *theoretically* (Höfding), *metaphorically* (Wundt), *abstractedly* (Höfding), or *ideally* (Dewey), is to say that they are *not* there, is to say that "the process is lost sight of altogether" (Bain), or that the phenomena are *unconscious* (i. e., non-existent), as Höfding, Wundt and others distinctly assert. Yet the implicit understanding amongst these writers is that the phenomena in question *are* there in consciousness.

2. *Perception does not, as stated, involve comparison.* Again, an appeal to consciousness amply justifies this objection. When I perceive the table before me, I do not compare the table with any idea of the table seen in past experiences; although, *after* having perceived it, another image of it may arise by association and the two may be compared. The table must obviously, however, be first perceived. It is, however, only "an implicate (*gebundene*) comparison" which is said to take place between the two elements. The two members in "free comparison" are conscious; in this elementary comparison on the contrary *unconscious*.¹

Wundt ("Logik," I, 17) informs us that in reference to the reproduction or recall of the memory-idea by the sense-impression, we perceive nothing of it. Consequently we perceive nothing of the comparison. Bain says ("Senses," 489): "In the perfect identity between a present and a past impression, the past is recovered and fused with the present, instantaneously and surely. So quick and unfaltering is the process that we lose sight of it altogether (!)." Sully ("The Human Mind," I, 181): "Such assimilation is automatic or unconscious," etc. Categorical enough are the statements and amazing the self-satisfied knowledge of the unconscious. I can assert just as well the opposite of what these writers affirm of the unconscious and it would exercise all the subtlety and keenness of a mediaeval scholastic, not to mention that of Messrs. Höfding, Wundt, etc., to disprove my statements. More, their statements of an unconscious conscious act are too obviously impossible to demand refutation.

We are also informed that this act of perception (= recognition or *Wiedererkennen*) is an act of association by similarity. The sense-impression calls up by association by similarity the similar idea of the same object. Moreover, Höfding calmly informs us that this is also an act of *comparison*. "It can also be called an *implicate comparison*, since it arises through similarity of the present impression with a former one." Let us suppose *A*, the sense-impression, to be present in consciousness, the problem is, how is *a*, the similar idea, to be brought there by comparison? Comparison, manifestly, presupposes the presence of the two before it can exist at all. Comparison with only one thing to be compared is worse than a distinction without a difference.

Again, supposing the comparison to be made after the two have arrived in consciousness, what is the need of a comparison if *A*, the sense-impression, is the object perceived, and

¹"Viertel. f. wiss. Philos.," XIV, §198.

a, the idea, is only another former impression of the object? How can, or why should, *a* identify, recognize, or fuse with *A* when *A* is just as much the object perceived as *a*, and why the comparison? F. H. Bradley ("Principles of Logic," chap. Association of Ideas) gives some excellent criticism on the untenability of the view that association by similarity can be brought about by comparison.

The discussion is much shortened, however, by the fact that the comparison is said to take place unconsciously.¹ It is still further shortened by Höfding's statements that the sense-impression *A* and the idea *a* (which?) are *contemporaneous, different, indistinguishable, identical*, and, to put the corner-stone on, *unconscious*.

3. *Perception does not involve the so-called process of "psychical chemistry."* The two elements *A* and *a* are said to "fuse" into one indistinguishable whole. "There is here accordingly an activity displayed, the result of which presents itself to consciousness, although it itself was exercised unconsciously."² The two elements are said to be only "*theoretically*" (not as a matter of fact?) present in consciousness. We are said to distinguish between them "only by means of abstraction."³ And Wundt knows nothing of the act of reproduction in the act of assimilation and perception; but nevertheless affirms that the two elements fuse (*verschmelzen*) to a single presentation ("Logik," I, 17). He says ("Physiol. Psych."), moreover, that the word "union" (*Verbindung*) has a "metaphorical" meaning.

If it be dark and mysterious to those initiated into the hidden secrets of the unconscious, what must it be to the uninitiated? What is in consciousness is surely a matter of fact, and not "theoretically" or "metaphorically" there. And how two unconscious ideas fuse, identify, recognize and compare each other in the unconscious and produce a totally new result is to me unaccountable. (*Vide* Stumpf's criticism of Hartley's and J. S. Mill's doctrine of "psychical chemistry," "Ursprung der Raumvorstellung.") James⁴: "Moreover, if feelings can mix into a *tertium quid*, why do we not take a feeling of greenness and a feeling of redness and make a feeling of yellowness out of them? Why has optics neglected the open road to truth, and wasted centuries in disputing about theories of color composition which two minutes of introspection could have settled forever?"

¹ *Vide* Dewey, "Psychology," p. 180; Höfding, "Viertel. f. wiss. Philos.," XIV, 198.

² Höfding, "Viertel. f. wiss. Philos.," XIV, 198.

³ *Ib.*, "Psychologie," §165.

⁴ "Principles," I, 157.

4. In perception there is no "reviving" of former impressions. The idea *a*, even if there should be one in perception, is not any one of the former sense-impressions of the object perceived. Few there are who nowadays believe that our former sense-impressions lie thick as ghostly bones in the tomb below the threshold of consciousness, waiting only some breath of life to raise them above the threshold as still ghostly images of their former selves. According to Höfding and a few others, the river Styx must be full of these ghostly wanderers. "Revive," "recall," "resurrect," "reproduce," "reawaken" are words used too often as shoddy explanations of the process in question.

Moreover, which of the many predecessors of the present sense-impression is the one "revived" and "reproduced," granting that such a "revival" were possible? Is there some particular former impression always on hand ready for the work of identification and recognition? Moreover, what a huge mysterious problem these authors have to solve in this doctrine of the preservation and reproduction of ideas! It is simply astonishing to me that nobody has raised any objections to Ward's solution, or rather description of these phenomena in his doctrine of the *Continuum* (Ency. Brit., Art. Psych.). He denies the usual statement that our ideas pass out of consciousness and are again reproduced as images of their former selves. But an upholder of the old theory might ask, what becomes of all our former thoughts and knowledge, where are they now? Ward answers that they are all in consciousness still, only "subconsciously." Our whole mental life, according to him, forms a *continuum*, in which all the past is, along with the present, in consciousness. The present is only more prominently there, the past, with all its thoughts, feelings, etc., is there also, but *subconsciously*. Hence there is no problem of reproduction of ideas. By "subconscious" Dr. Ward does not mean unconscious, but rather some degree or measure of consciousness. The whole doctrine, for me at least, is amply refuted by the fact that it is purely and absolutely a false description of the facts. I am conscious neither subconsciously, unconsciously nor consciously at the present moment of time of the vast majority of my former mental experiences. As far as my present consciousness goes, they are absolutely non-existent.

But to return to the more immediate problem, does consciousness say that the "reproduced former idea" recognizes the present sense-impression, or that the present sense-impression recognizes the former reproduced idea? Not at all. Plain, unvarnished, unprejudiced consciousness says in perception, "This is object so-and-so," and in recognition

proper, "This is object so-and-so again." Of the "recognition" and "identification" of the present sense-impression *A* by the "reproduced memory-image" *a*, there is never a sign.¹ Moreover, how can the presentation *Object A* recognize or identify another mental presentation *Object a*? Consciousness, in fact, says nothing of the two presentations being there in perception at all. It is simply *Object A*.

Prof. Höfding says, "*Under other circumstances*" the idea-element in perception could be recalled as an independent idea ("Psych.," 166); i. e., I might say, if it had not been as it actually is, it might have been otherwise; or, in other words, if it had not been a single, indivisible idea, there might have been two. He thereby admits that there is only one presentation there, and that the other is a fiction. Observation shows the fact that there is only one presentation there in perception. Then, "*tant pis pour les faits*" Prof. Höfding may answer along with the speculative Frenchman; they must be there *unconsciously*. In the world of science, he who finds his hypothesis at variance with large parts of the evidence forthwith abandons it; even in ordinary life a man whose supposition proves to be flatly contradicted by observation is expected to hesitate. Prof. Höfding has ever, however, his City of Refuge—the Unconscious.

5. *There is an unwarrantable extension of the term "recognition" to perception.* There is a class of phenomena which Prof. Höfding has remarked, a class which is really what we all call recognition. This class he has designated "immediate recognition," and rightly so. The extension, however, of this designation to the whole field of perception is quite unjustifiable.

We have often a very strong conviction of having been before in the same place or in the same circumstances as those of the present presentation, but, nevertheless, can recall no other circumstances which confirm the conviction. The places or circumstances appear perfectly familiar, though we know we have never seen them before. They appear, as we generally say, *known* to us. As Höfding says, "A single trait of a countenance, a color-tint of the sky, an accidentally heard word can appear to us as known (*bekannt*) without us being able or even without us feeling the need of referring them to definite former occurrences. They appear to us differently from perfectly new sensations." This peculiar feeling of *knownness* he calls the *Bekanntheitsqualität*.

This feeling of strange familiarity is, however, character-

¹Cf. Bourdons, "La Reconnaissance de phenom. nouveaux," *Rev. Philos.*, 36, p. 630, and A. Lalande, "Sur les paramnesias," *Ib.* 36, 485-497.

istic of only a very small class of phenomena. That is why they are called *strange*. Everyone knows, however, that this feeling of strange familiarity does not characterize all our perceptions. If so, then why the *strangeness*, the wonder and the curiosity which are aroused when the phenomena actually do occur? Höfding has quite unwarrantably, however, extended the designation of this class of phenomena to the whole field of perception. Our perceptions are not all accompanied by this characteristic of strange familiarity or knownness. Moreover, these special cases of familiarity are cases of perception + recognition, as will be explained in a succeeding essay. If so, it is doubly false to say that perception is recognition, *Kennen Wiedererkennen*, etc.

6. *The cause of the Bekanntheitsqualität is incorrectly given.* Höfding draws a distinction between "old sensations" (*alte Empfindungen*) and "new sensations" (*neue Empfindungen*). The "old sensations" are apparently those which we have had before, which can be "revived" and "reproduced." These sensations have been repeated. On the physiological side there has been repeated practice. The movements, whatever they may be, take place more readily, with less expense of effort and strain than they did at first. Consequence—there appears on the psychical side a corresponding change, viz., the quality of knownness or the *Bekanntheitsqualität*, which is apparently of an elementary, irreducible kind. Old sensations, when accompanied by this feeling, this *Bekanntheitsqualität*, are known, even thereby do they appear as *old* or *known*.

The "new sensations," on the other hand, according to Höfding, do not possess this quality of knownness. If they did, we could not distinguish between the old and the new sensations.

But what are these "new sensations"? Firstly, they may mean sensations which we never had before—sensations of a new sense, to which we have not yet developed. Or they may mean the first sensations which we ever had at the beginnings of our lives. Secondly, Höfding means by "new sensations," although he does not notice the confusion, the fresh, vivid sense-impressions in contradistinction to the revived faint images of former impressions. The one class is old, faint, ghostly; the other fresh, new. The fresh, vivid and present sense-impression is a new creation in comparison with the revived image of the old, which is only a reproduction and not a fresh creation.

The fatal point for this plausible doctrine is that *these sense-impressions, these "new sensations" of the second class demand, on the physiological side, just as much practice*

and repetition as the so-called "old sensations," and therefore should possess just as much the *Bekanntheitsqualität* as the "old sensations." The sense-impression *red* has, in all probability, the same nervous concomitant processes as the image *red*; in both the nerve processes have had very extensive practice and repetition, the one as much as the other. Hence, the sense-impression should have the *Bekanntheitsqualität* just as much as the image-element. In Höfding's perception formula (2) then, the sense-impression element *A* ought already to have the *Bekanntheitsqualität* before the so-called image-element *a* arrives, and ought to have it just as much as the other. If such be the case, Höfding's hypothesis of the image-element *a* contributing the knownness element is utterly useless.

The more probable explanation of this phenomenon of strange familiarity will be attempted in another essay.

7. Finally, the theory utterly fails in its attempt to explain sense-illusions or what may be called abnormal perception. In journeying upon a road in the deep twilight, I see the threatening figure of a robber with up-drawn, menacing arm. At the moment I am most certain and positive that it is a robber. For me, at the time, it is just like all my other perceptions, perfectly normal. Upon closer investigation, however, I perceive the objective figure to be in reality the stump of a tree with its gaunt, outstretched limb. Now I perceive that my first impression was abnormal, that it was a sense-illusion.

And now for the recognition-theory explanation: "The sense-illusion is a mistaken, partial perception. With (1) *b* and *c* unite themselves, although in this case they do not really belong with *A*. A mistaken interpretation of an objective impression takes place, as, e. g., when a white towel in the moonshine is taken for a white figure, or wreckage on the coast for men." (Höfding, "Psych.," 197.)

To say that a sense-illusion is a mistaken perception is easy, but no explanation; to say it is a partial perception is partially false, and it gives no explanation at all why I thought there was a robber there, which is the essence of the matter. The formula given by Höfding is false to the facts,—it runs (2) $+ b + c$. If *A* represents the stump of the tree, then (1) means that the stump of the tree is perceived as such, which is absolutely contrary to the facts. If I had perceived the stump of the tree, it would have been no sense-illusion; but I did not perceive the tree. It was a robber. The formula, therefore, gives a false description of the facts, and, moreover, provides no explanation of the fact that another presentation or perception, viz., the robber, arises. In fact, the

theory is again at fault in its description, for in the sense-illusion there was no *second* perception, viz., the thought or perception of the robber. That was the first and only perception. The perception of the tree stump came *later*, not as in the formula first, and then we knew that the first perception (the robber) was an illusion.

Granting even that we perceive the tree stump (\mathfrak{A}) first, which of course we do not, why should $b + c$, the thought of the robber, arise? The recognition-theory formula gives no explanation whatever.

Let us, however, suppose that in $(\mathfrak{A}) + b + c$, \mathfrak{A} means the dark outline of the tree stump and $+ b + c$ the perception of the robber. Again it would be a false description of the facts.

We do not perceive a dark outline and then have the second thought of a robber. The robber is the first and only perception. Moreover, in the quick flash of the perception, who would be aware of the recognition process involved in (\mathfrak{A}), viz., the sense-impression \mathfrak{A} , the calling up by association through similarity (comparison also!) of the "memory image" a , the identification, recognition and fusion of the two and the birth of the new product by psychical chemistry (which is neither a nor \mathfrak{A} !)? All these processes would presumably produce the perception of the dark outline of the tree stump. This, however, we do not perceive; it is, rather, a robber.

But why pursue the investigation further? Any one of the above objections ought to make us hesitate before ever again giving countenance to this old, traditional theory, which has ruled the psychological world since the days of Democritus and Empedocles.

RECOGNITION.

BY ARTHUR ALLIN, M. A., PH. D.

1. *The Strange Feeling of Familiarity.*

Sir Walter Scott in "Guy Mannering" writes: "How often do we find ourselves in society, which we have never before met, and yet feel impressed with a mysterious, ill-defined consciousness that neither the scene nor the subject is entirely new; nay, we feel as if we could anticipate that part of the conversation that has not yet taken place." Oliver Wendell Holmes in the "Autocrat of the Breakfast Table" (p. 103) also writes: "All at once a conviction flashes through us that we have been in the same precise circumstances as at the present instant, once or many times before." Shadworth Hodgson in "Time and Space" (p. 273) speaks of "another phenomenon of the very opposite to that of apparent novelty. It is when we have a strong feeling of the sameness of objects, or states of consciousness in redintegration with some object, or state of consciousness which has preceded, but what or where we cannot remember. I allude to cases of dreams and, more rarely, of waking perceptions, where we have a strong conviction of having been before in the same place or the same circumstances as those of the present presentation or representation, but nevertheless can recall no other circumstances which confirm the conviction. Sometimes we dream of a place which appears perfectly familiar; sometimes we see a place waking, which appears familiar, though we know we have not seen it before, and then, perplexed, say we must have seen it in a dream. Here are cases of an *inexplicable sense of familiarity and recognition*, obtaining in dreams, in waking, or in cases which perhaps consist of both. It seems to me probable that this sense of familiarity depends on the rousing of the same particular feeling of interest by two or more different perceptions; and that, from the identity of the interest, we infer the identity of the objects of presentation or representation."

Charles Dickens in "David Copperfield" and in "Martin Chuzzlewit"; Tennyson in "Two Voices," "Early Sonnets,"

and "The Princess"; Thomas Hardy in "A Pair of Blue Eyes"; Edward Dowden, Pierre Loti, Lowell, and many others, have all borne testimony to the same experience.

"I have been here before,
But when or how I cannot tell:
I know the grass beyond the door,
The keen, sweet smell,
The sighing sound, the lights around the shore."

So Rossetti in "Sudden Light," and

"You have been mine before—
How long ago I may not know:
But just when at that swallow's soar
Your neck turned so,
Some veil did fall—I know it all of yore."

One recalls at once Wordsworth's "Our birth is but a sleep and a forgetting," "not in entire forgetfulness," and "those shadowy recollections."

Persons of a poetical, mystical and speculative nature speak of these experiences as "vestiges of a previous state of existence, as an echo from a life anterior to the present one." Plato's doctrine of "reminiscence" and immortality has probably a psychological basis in this strange feeling of familiarity. Coleridge writes: "And some have said we lived ere yet this robe of flesh we wore." One writer speaks of these "convictions of metempsychosis difficult to shake off."

Sir James Crichton-Browne, M. D.,¹ regards these experiences "not as intimations of immortality, but as revivals of hereditarily transmitted or acquired states in new and special combinations." They have been enthusiastically described as "indescribable" and "transcending all common experience," as "excursions into that infinite field that lies behind appearances, and of which it is dangerous to affirm or deny anything. Plunges they are into these depths of outer mystery in which the certitudes of faith arise. Momentary realizations they become of Nirvana, or the cessation of being, or foretastes of purgatorial pains more scorching than any that Dante conceived."

Again, these phenomena occur in circumstances the most commonplace and trivial, as in blacking boots, picking up a pin, etc.

¹ *Lancet*, July 6th and 13th, 1895. MM. Dugas, Lalande, and van Biervliet (*Rev. Philos.*, 1893 and 1894) in their discussions on this subject give many other interesting cases well worthy of being noted. Their explanations are, however, hardly on a par with their examples. Vide also, "Sulla paramnesia, o falsa memoria." Nota del Prof. Tito Vignoli (*Rendiconti del R. Istituto Lombardo*, 1894). Prof. Burnham in *AMERICAN JOURNAL OF PSYCHOLOGY*, Vol. II, gives many cases and much bibliography on the subject of paramnesia.

Some account for these phenomena by Wigan's doctrine of the brain's being a double organ, its hemispheres working together like the two eyes. One of the hemispheres hangs fire, they suppose, and the small interval between the perceptions of the nimble and the sluggish half seems an indefinitely long period, and therefore the second perception appears to be the copy of another, ever so old—manifestly a doctrine not much better than the scholastic one. "*Memoriæ sedes, ac velut fabrica, in occipitio est a natura collocata, admirabili sapientia, quod præterita cernat.*"

M. Lalande explains these phenomena as due to a moment of absence, followed by a brusque awakening of the attention: one perceives without apperceiving; upon this sensation becoming an object of apperception, the phenomenon in question arises. The sensation is met and recognized by its memory-presentation (*se souvenir surgit des ténèbres de l'inconscient, et il dissipe ces ténèbres*). These two mental presentations associate with each other without being able to fuse; hence a memory-presentation which produces the effect of a perception and a perception which produces the effect of a memory-presentation.¹

Wigan ("Duality of the Mind," 1844, pp. 84-5) speaks as follows on this subject: "Sir Walter Scott calls this mental phenomenon 'a sentiment of pre-existence.' It is a sudden feeling, as if the scene we have just witnessed (although from the nature of things it could never have been seen before) had been present to our eyes on a former occasion, when the very same speakers, seated in the very same positions, uttered the same sentiments, in the same words — the postures, the expression of countenance, the gestures, the tone of voice, all seem to be *remembered*, and to be now attracting attention for the second time. *Never* is it supposed to be the third time."²

¹ M. Lalande admits also a *telepathic* sense, perceiving in advance facts which one would not fail to *recognize*, when they fell afterwards under the ordinary senses. M. Dugas "in order to escape the humiliation" of resting short without a decent hypothesis, suggests that "false memory is a very special case of the doubling of the personality!" But how and why should this doubling of the personality take place? "Perhaps," he says, "in consequence of a spontaneous self-hypnotization!"

² Höffding in his *Psychologie* and in other articles notices these peculiar phenomena and calls them "immediate recognition"; he, however, most unwarrantably, extends this designation to *all cases of perception*, although it is perfectly manifest that all cases of perception do not have this strange feeling of familiarity attaching to them. It is just on account of the scarcity of the phenomena that we add the epithet "strange." Höffding writes: "An individual trait of a countenance, a color tone of the sky, an accidentally

Now this delusion occurs only when the mind has been exhausted by excitement, or is from indigestion, or any other cause, languid, and only slightly attentive to the conversation. The persuasion of the scene, being a repetition, comes on when the attention has been roused by some accidental circumstance, and we become, as the phrase is, wide awake.

"I have often noticed this in children, and believe they have sometimes been punished for the involuntary error, in the belief that they had been guilty of deliberate falsehood."

This is the phenomenon of *strange familiarity* which has to be explained. It plainly includes *perception + the feeling of strange familiarity*. This Höfding calls "immediate recognition," and extends the designation to all cases of perception, asserting therefore that in each case of perception we have perception + the feeling of strange familiarity. And if the feeling of strange familiarity is the recognition-element, then Höfding is certainly not correct in saying that *perception alone is recognition*.

This phenomenon has to be explained and also the somewhat frequent phenomena of recognition in general, i. e., of *object-known-againness*. Certain phenomena, however, generally asserted to be memory and recognition, must first be shown to be no memory or recognition.

2. "*Half-dream conditions*," dreams, imagination, in short, all centrally excited presentations are not thereby phenomena of memory and recognition.

"Half-dream conditions" are the *Halbtraumzustände* of the Germans, and are the object of frequent references in the

heard word can appear to us as known (*bekannt* = known again or recognized, with Höfding), without our being able or even without our feeling the need of referring them to definite former occurrences. They appear to us differently from perfectly new sensations. They have a different stamp. It is the same when we are not able to call back a name in memory, while we are at once absolutely sure that this was the one meant upon its being named. Here, also, the recognition is immediate; the name sounds to us as immediately known (*bekannt*). The difference between that which appears to us as known, familiar, home-like, and that which appears to us as new and unknown, cannot be described more nearly. This difference is given just as simply and immediately as the difference between red and yellow, or between pleasure and pain. Repeated sensations can present themselves to us with a peculiar quality, which one could name the *quality of knownness* (recognition) (*Qualität der Bekanntheit*) as the opposite of the *quality of strangeness*" (S. 163). It is hardly needful to point out the confusion of thought which Höfding labors under in the use of the word "*bekannt*." Because we know or are acquainted with an object, we do not necessarily have the subjective experience of *object-known-againness*. An object known with "the quality of strangeness" ought to be, if these psychologists were consequent in their thinking, a contradiction in itself.

psychiatries. Krafft-Ebing names them *Dämmerzustände*. Epileptics show quite a tendency to fall into this state. Fatigue induces it in many cases. Unwonted strain in unwonted surroundings is often the inducing cause. Their usual circle or world of ideas vanishes, or rather changes, and the subjects live, so to speak, in a different world. Such persons, if at a long distance from home and if subject to a strange and new set of conditions (homesickness), are apt to be subject to these attacks. Young soldiers, without any premeditation, attacked by these "half-dream states," visit their far-off homes, and in terror awake from this condition far from their garrison town.¹ Westphal describes this as a condition in which consciousness can be deeply disturbed, and in such a way that the person concerned moves in a world of ideas which appears separated or loosed from his normal one. Acting in accordance with this abnormal circle of ideas (with their concomitant feelings and will-movements), he performs acts which are completely foreign to the usual content of his thinking, and which have no relation at all to it. Nevertheless coherent and, up to a certain point, consequent action remains intact, all being in accordance with the prevailing set of ideas.

The causal mechanism of these half-dream states one may construe after the analogy of dreams, in which the ideas of the day time, involving strained and fatiguing exercise of the cortical centres, are replaced by unusual ideas,—ideas, the objects of which were experienced in a far away, more remote time. Students in a foreign land are apt to experience this during the first few weeks of their sojourn. It is homesickness. The new surroundings fail of associations and interest; it is strain and tension to attend to them. The world lived in is the old world, the home world. In lying down upon the sofa during the day for a rest, the same phenomenon occurs. The cortex during the day has been in a severe state of *tension*. The activity has been prolonged and great, the strain unceasing. Rest comes at the end of the labor. The muscular strain is relaxed. The waste products of the system, which clogged and delayed the reparative process, have now freer and more unimpeded channels. All function is less restrained and follows the line of least resistance. It is easier for the nervous impulses to slide into the old paths than to attempt to scale the heights, or pioneer in comparatively new and untrodden paths. The new associations formed during the day, or at least quite recently, involved much pioneering, strain and nervous exhaustion; this, however, gives way after the tension is

¹ Meynert, "Klinische Vorlesungen über Psychiatrie," S. 81.

over. The old-established and oft-repeated associations have now the right of way. As in financial crises, the "old-established houses" almost always weather the gale; the new houses go to the wall. Their "connections" are at different stages of growth. When falling asleep and immediately afterward reawakening, we find, usually, not the events of the day, but those of far-off experiences to be the subjects of our dreams. Even in lying down on a sofa for a complete rest, the same phenomena occur. In cases of general break-up, when the strong nervous organization of the brain begins to fail, general names remain the longest.

If those phenomena usually designated "will" have their physiological correlate, not in any one definite locality of the cortex, but rather in each presentation centre, then we may more easily understand how it is that the movements and actions of the patient are connected with, or flow from, the presentation centres actually prevailing.

Ross, in his "Diseases of the Nervous System," says (p. 137): "Experiments on animals have shown that a nerve whose nutrition is lowered, discharges its energy more readily than one whose nutrition is perfect, and similarly when the nutrition of the *sensorium commune* is defective, it responds to stimuli of less intensity than when its nutrition is normal." "The depressing emotions, such as fear and anger, are also liable to become excessive during states of nervous exhaustion, and it is a matter of common observation that a person who is in feeble health is often very irascible, while others are easily excited to laughter or tears." "When the inhibitory action of the highest or higher coördinating centres is removed, the functional activity of the lower centres may be increased. Many atrocious murders are said to have been committed during the period of semi-consciousness which sometimes follows an epileptic seizure. . . . It is probable that in delirium the stock of irritable matter in the gray substance of the cortex is much exhausted, and that what remains manifests an undue degree of irritability, so that the protoplasm gives out energy either spontaneously or on the application of slight stimuli, while functionally there is a dissolution from the later to the earlier acquired feelings and experiences."¹

It is during these fatigued states that strange and unlooked-

¹ Holmes somewhere says: "The seat of the will seems to vary with the organ through which it is manifested; to transport itself to different parts of the brain, as we may wish to recall a picture, a phrase, or a melody; to throw its force on the muscles, or the intellectual processes. Like the general-in-chief, its place is everywhere in the field of action."

for associations occur, thus giving rise often to some of those cases of strange familiarity cited above.

These states of half-dreaming, dreaming and imagination are not memory or recognition proper. There is no reference whatever to the past. They are what may be called *object-consciousness*. And if time enters into these phenomena it is a present time. The dreams of savages are often asserted to be for them real, as if they were not so for us also. The only difference lies in the after-thought of those dreams. To both they are real during the dream. So with illusions and hallucinations. *During these states*, the objects are regarded as objectively present, just as much as in the every-day normal perceptual world.

We thus attain to two classes of phenomena, the *peripherally excited* and the *centrally excited*. The latter class has generally been called *memory*, but quite wrongly so. There is absolutely no reference to the past whatever in them, of themselves. It is an additional process, that of memory and recognition. With the exception of the element of *reproduction* in his teaching, Christian Wolf saw clearly some truth in this matter. He writes, "*Psychologia Empirica*," §176: "*Facultas ideas, quæ antea habuimus, reproducendi, non pertinet ad memoriam*," and "*Facultas producendi perceptiones rerum sensibilibus absentium Facultas imaginandi seu Imaginatio appellatur*," §92. Note the *definition* he gives and the *example*, "*Ideam reproductam recognoscere dicimur, quando nobis consciû sumus, nos EAM jam antea habuisse. Videmus hominem in templo alibi jam ante visum. Dum eum intuemur, consciû nobis sumus, nos EUM jam ante vidisse*," §93.

To say that memory and recognition is explained by the *reproduction of former experiences*, which would be simply the former perceptions, present, fresh, etc., is to give an explanation precisely on a par with that of the scholastic quoted above. "*Memoriæ sedes, ac velut fabrica, in occipitio est a natura collocata, admirabili sapientia, quod præterita cernat*."

The lonely traveler actually sees a robber with outstretched arm in the gathering twilight. He *sees* the robber, and it is to him a robber. It is a full and complete perception of a robber — for him. But the external object is the stump of a tree with a gaunt, outstretched limb. There are then in this perception certain elements of the perception *centrally excited*. They were not, however, on that account memories or memory pictures (*Erinnerungsbilder*). They were like the sense-impressions; in fact, they *were* sense-impressions. Manifestly, centrally excited presentations are not on that

account memories; though memory is often thus explained, viz., as the reproduction of former impressions.

It may be argued that the centrally excited presentations cannot be explained otherwise than as reproductions of former sense-impressions. But if the sense-impressions are regarded as new creations, so also may the centrally excited ones. Carpenter puts forward the probable causal mechanism on the physiological side in a very terse, concise form. He writes ("Mental Physiology," p. 440, 1891): "As the sensori-motor apparatus — the instrument of our *bodily* activity — appears to *grow* to the mode in which it is habitually exercised, so we seem justified in assuming that the same thing is true of the cerebrum, which is the instrument of our *mental* activity. . . . The material particles constituting this (nervous) system are continually changing, but, according to the laws of nutrition, the structure itself is kept up by reposition of *new* matter in the precise form of the old."

Wundt's definition of a memory-image (*Erinnerungsbild*) is hardly seaworthy. He writes: "We give the name of *Erinnerungsbilder*, or memory-images, to those reproduced ideas, which are so similar to certain former perceptions that they are referred directly to the same." Objections: Ideas are not "reproduced"; "certain former perceptions" are not now present, as stated in the definition; the similarity between the two is not a datum of consciousness; no comparison takes place between them; nor are the *Erinnerungsbilder*, or memory-images, referred directly or indirectly to the former perceptions, as consciousness asserts that the object is known again, not the former perception. Wundt classes together indiscriminately under the name of *Erinnerungsbilder* both centrally excited presentations and other presentations to which are attached the characteristic of "known-againness." Moreover, what can be meant when Wundt says, "The reproduced idea is referred to former impressions"? Is not, according to the definition, the "reproduced idea" the former impression? If it be the same, then how can the one be referred to the other? If it be not the same, then, when it is referred to former impressions, those impressions must be in consciousness at the time in order to be referred to. If they are in consciousness, then nothing is gained, for they are no longer the former impressions. What, also, does this "reference to former impressions" mean? Surely an essential point.

3. Assimilation or Association not Recognition.

Sully ("The Human Mind," I, 181) says: "A simple process of re-cognition is involved in all cognition," and

names this "automatic assimilation or recognition." Herbert Spencer writes: "Every relation, then, like every feeling, on being presented to consciousness, associates itself with like predecessors. Knowing a relation, as well as knowing a feeling, is the assimilation of it to its past kindred; and knowing it completely is the assimilation of it to past kindred exactly like it. . . . Thus the fundamental law of association of relations, like the fundamental law of association of feelings, is that each, at the moment of presentation, aggregates with its like in past experience. The act of recognition and the act of association are two aspects of the same act." ("Principles of Psychology," I, 267 and 270). Wundt identifies recognition with assimilation and defines assimilation as follows: "An assimilation takes place, then, when a new presentation enters consciousness, reproducing former presentations similar to it, and when these elements fuse to a single presentation. Of this reproduction process, we perceive in this case nothing." ("Logik," 2te Aufl. I, 17). One may also cite, besides many others, Höffding (*passim*), who makes perception also an assimilation and assimilation a recognition. For more lengthy quotations see article "The Recognition-Theory of Perception" in this number.

Dr. James Ward ("Assimilation and Association," *Mind*, 1893, p. 347) writes: "Nothing can be plainer than that association in strict propriety of language implies two or more distinguishable and distinct individuals; and is in this respect different from amalgamation or fusion, which both imply the merging of two or more bodies into a new complex and compound." Even granting that such an act as is described by these psychologists under the name of assimilation, fusion of similars or association may take place, *it seems, however, utterly impossible to get recognition or known-again-ness from such an association, fusion or assimilation.* Objectively considered, it may be a second cognition, and in this case a re-cognition, but subjectively it would be *for the percipient's consciousness* simply (Object + Object), becoming eventually fused into (Object), the parentheses signifying a unified act.

Moreover, if it were a case of *association*, then the two presentations associated must be separately cognized in order to be associated. The double cognition of an object will avail nothing. If each cognition is, in their language, however, a recognition, then each cognition will have to be explained by an infinite *regressus* of assimilations. In association the members associated remain distinct and separate after the act, in fusion, on the contrary, they are supposed to lose their separate identity in a new and different product. Granting what to

me is an impossibility, viz., mental fusion, there still remains the same impossibility of recognition or known-againness arising from such a fusion. Prof. Höfding naïvely admits that such a recognition or memory is "theoretical," "implicate" (*gebundene*), etc., thereby asserting that the phenomena are not actually there in consciousness. This "theoretical," "metaphorical" memory¹ reminds one of Cicero's dictum *re the quasi corpus* of the Epicurean god: "*Corpus quid sit intelligo: quasi corpus quid sit, nullo prorsus modo intelligo.*"

Nor, again, do collateral presentations (*Nebenvorstellungen*), however closely connected with the object cognized, explain the recognition or known-againness of that object. It is nothing to the point in this case, too, if these *Nebenvorstellungen* arise by the so-called processes of association by contiguity or by similarity. The *Nebenvorstellungen* are either a second presentation of the same object, which is, *subjectively*, no known-againness of the object; or they are presentations of some other objects, which is obviously again no known-againness of the first object; or they are emotional or feeling presentations, which also are no knowing-againness or known-againness of the first object. Lehmann, Offner and Ward, as well as many others, seem to be guilty of this mistake. Lehmann's articles are well known. Offner (*Zeitschrift f. Psychologie*, VIII, S. 146) says: "*Die Bekanntheitsqualität ist auf ein Hereinwirken sich nicht über die Schwelle erhebender durch Berührung assoziierter Nebenvorstellungen zurückzuführen.*" Ward in *Mind*, 1894, article "Assimilation and Association," II, p. 532, says: "The mere sense of familiarity or facility is, then, not strictly a recognition, or identification of present impression and past image, but a subjective state partly active, partly emotional." Ward also writes (*Ib.*, p. 527): "This earliest and purest assimilation thus briefly indicated, agrees, I believe, in the main with the theory of simple recognition which Höfding has discussed in such a fresh and lucid manner. What Höfding has specially called the *Bekanntheitsqualität* answers to the more subjective side of the process. This I ventured to suggest might be symbolized as $A\gamma$, $B\gamma$, etc., inasmuch as this quality is no part of the content of the presentation recognized, and is essentially the same for one presentation (A) as for another (B). It has been only incidentally referred to here, as

¹Ward, *Mind*, 1894, p. 528: "Reproduction, like association, presupposes assimilation and not *vice versa*. Of course, strictly speaking, till we get beyond assimilation, the distinction of A and a is mainly an analytical distinction. The 'tied idea' has no free existence, and in actual apperception has no independent existence."

we were mainly concerned with the 'tied' or implicit idea symbolized by the small letter in Höfding's bracket (λ). But it is important to note that both the γ and even this a come into existence through subject activity and interest, and are not produced solely by the primary impression or A. No doubt A is regarded as active in reviving or reproducing a , i. e., on the associationist view; but here it is rather a that is active in apperceiving and appropriating A." In addition to the above remarks, I have tried in a preceding article to show that this "sense of familiarity or facility" arising, as they say, from practice, repetition and functional activity ought to accompany every sense-impression as well as the so-called ideas, for *both* demand the same amount of practice, repetition and functional activity. It ought also to be perfectly obvious truth for such able psychologists as these, that not all of the sense-perceptions or "ideas" are accompanied by this feeling of familiarity, facility or known-againness. Only a small fraction of the whole are so accompanied, yet on their argument it is quite necessary that they all should be so accompanied. This link in their chain-armor is decidedly weak, leads in fact to their utter undoing.

I fail also to see how the greater facility with which a presentation arises can *of itself* be the consciousness of known-againness. It is a valiant deed of Prof. Höfding's to attempt to solve this problem by calling this sense of facility the *Bekanntheitsqualität* and then asserting that it is something *ultimate*. The thing is easy, but the saying is hard to understand.

In the former article there were pointed out the mistake and confusion involved in the terms "new sensations" and "strange, unknown sensations." Ward (*Mind*, 1894, p. 353) makes a similar mistake: "Apart from all hypothesis or inference we have first a new or strange experience, A; then after more or fewer repetitions, we say this experience is 'cognized' or is 'familiar.'" Upon the recognition-theory of perception, how is it that any object whatever, is for the *first* time cognized; for according to it, all cognition is recognition, and the recognition element is derived from the familiarity element, which is due to much repetition? These many words about change in an idea through practice and repetition are, to me at least, all beside the mark. *The change wrought is the greater facility of coördination in the centres necessarily involved in each presentation.* The slowness and delay of the coördinating activity of the nervous formations upon sight of something not seen before appear to be a much less hazardous hypothesis than that of the creation or gradual evolving of "new sensations." A part of the

gradually evolved feeling of familiarity with an object may be partly due to the play of associations, lacking in the first case and later gradually acquired; this association being again a further case of the coördinating activity of the various nervous formations. Perhaps the localization theory of brain functions may have some light for this psychological problem. Bonnet, according to the following (cited by Offner, *Philos. Monatsh.*, 1892, S. 407), propounded the same teaching as Höfding, Ward et al.: "*Ich habe daher gemuthmasst, dass jungfräuliche Fibern (auf die Seele nicht genau so wirken, wie diejenigen, welche es nicht sind; und ich habe die Empfindung der Neuigkeit eben diesem Zustande der Jungferschaft der empfindlichen Fibern zugeschrieben.*" "*Die Empfindung, die mit dieser mehreren Nachgiebigkeit und Beweglichkeit verknüpft ist, macht die Erinnerung (d. h. wohl nur jene eigenthümliche Färbung oder Qualität einer Vorstellung, welche sie als Erinnerung gegenüber der Wahrnehmung charakterisirt) aus, welche um so lebhafter wird, als die Fibern nachgebender oder beweglicher werden.*"

4. Recognition Objectively and Subjectively Considered.

"Recognition," "Wiedererkennen" and "reconnaissance," as at present used, are ambiguous terms. The objective and the subjective considerations of the process are not held apart. Hence arises an exemplification of the "psychologist's fallacy," *i. e.*, the confusion of the standpoint from which a conception or process is expounded with the standpoint at which it is experienced.¹

Objectively considered, it means that a person may cognize an object a second time (*re-cognition*) without being subjectively aware that it is a second perception of the object. The second perception or presentation may be merely a simple awareness of the object, and yet be for the thousandth time perceived, and perceived with the greatest of facility. For the subject, however, it is at the time no proper recognition.

Subjectively considered, the true and proper recognition to be explained is the knowledge or consciousness that the object in question is again perceived or presented. It is known-againness.

According to Sully, Höfding, *et al.*, there is invariably in recognition "a recognizing of the former impression." This is certainly a false description of the facts. The affirmation of consciousness is *not* that the former impression, but that the object, an external reality, is again perceived, or is known again. The difference is all-important. Probably prepossessed

¹ Cf. Ward, *Journal of Spec. Philos.*, 1882, and James, "Principles."

and prejudiced by metaphysical assumptions of an "idealistic" character, the prevailing teaching has been that if there is a known-againness in recognition, then it cannot be of an external object, but of the former perception. If the former impression be therefore known again or recognized, it must necessarily be reproduced, and when recognition was extended to comprise the whole field of perception, the former impression must be there also, and if you cannot find it, it must be there, but unconscious! Ward, with more courage than his contemporaries or predecessors, goes still further, asserting in his doctrine of the *continuum* (Art. Psychology, Enc. Brit.) that all our presentations, both present and *past*, are still in consciousness, though most of them are there subconsciously! (And note, the word "subconscious" does not mean with Ward "unconscious.")

Consciousness in perception is object-awareness; in recognition it is object-known-againness, and not former-perceptions-known-againness. Höfding himself unwittingly admits it. "A single trait of a countenance, a color tone of the sky, an accidentally heard word can appear to us as known again (*bekannt*=recognized) *without our being able, or even without our feeling the need of referring them to definite former experiences (Erlebnisse)*" (*Psychologie*, 2te Aufl. 161).

Let us now take a case of recognition. I perceive now this book before me. That is a perception. If I had passed on to some other object immediately, there would have been no recognition of that book; but after the perception of the book, a fainter presentation of a person who gave me that book arose, although that person was not externally then present, and on the ground of that characteristic I classified that book as known-again.

I may close my eyes and have an idea-presentation of that same book. The presentation is to me an object, faint in its colors, incomplete in its details, localizable almost anywhere in space. If I do not notice those characteristics, other objects may succeed and there will be no known-againness; but if I notice those characteristics, I may then at once classify that object as being a *second* time known.

I have, when walking along the street, met a person who is a stranger to me; I say to myself, I have met him before, although I am otherwise certain that I never have. Upon closer examination, I found a pleasurable feeling which arose through the partial resemblance of that person's countenance with the countenance of one of my friends. I believe that the characteristic upon which the classification of known-againness was based was in this case the pleasurable feeling.

Often I have noticed the quick image-presentation which

frequently follows immediately after the sense-presentation, to be the characteristic which was the starting point for the classification.

Neither the characteristics nor the classification, taken alone, make up recognition, but both together. The characteristic may be variable, the classification remains the same.

5 Some Characteristics.

1. Lack of liveliness, freshness and vividness in contradistinction to the qualities of objects perceived or the objects of hallucination. (Hume.) This lack of freshness, etc., may possibly consist in lack of details, or in duller and less strong sensations.¹ I need scarcely add that not only the objects of central excitation, but also the objects of peripheral excitation are capable of being known-again or recognized.

The opposite characteristics, *i. e.*, liveliness, freshness, vividness, fixity of spatial localization, etc., are the characteristics upon which is based the classification of the object as known, *here or there*, and *now*. This is perception. Objects are often perceived with these characteristics and are accordingly classified as *perceptions* when they are really *hallucinations or sense-illusions*. *At the moment* they are for the subject perceptions, and at the moment the classification upon the basis of certain characteristics took its normal course. Later observation shows that the external object really was not present. I believe that I have experienced cases of the opposite kind, where the object of the peripherally excited presentation was given very faintly and the classification ensued of known-againness.

2. Absence of definite spatial localization. The image (centrally excited presentation) of a friend may be localized almost anywhere or anyhow; in the perception of that friend, the object is exceedingly definite in its localization. Upon this characteristic, a classification may follow.

3. The lack of persistency, air of freedom possessed by images in contradistinction to the obstinate steadfastness of perceptions. Through all preceding philosophical speculation, there has been an emphasis of this phenomenon. In perception, they said, the mind was more *passive*, the image of the outer object was *impressed* upon the mind, the mind was more or less determined; while in the idea-world, there was freedom, and free activity. Perception is and has been one

¹For the discussion of this question we may refer to Lotze, "Metaphysik," 502-539; "Med. Psych.," 225. Stumpf, "Tonpsych.," Bd. I, 373 ff.; Bd. II, 276 ff. James, "Principles," I, 425. A. Meinong, "Viertel. f. wiss. Philos.," XIII, *Ueber Begriff und Eigenschaften der Empfindungen*.

of the anchors of certainty. "*Mein Jetzt und Hier ist der letzte Angelpunkt für alle Wirklichkeit, also alle Erkenntnisse*" (Lipps, *Grundtatsachen*, S. 400). "*Sonnenklar ist nur das Sinnliche, nur wo die Sinnlichkeit anfängt, hört aller Zweifel und Streit auf. Das Geheimniss des unmittelbaren Wissens ist die Sinnlichkeit*" (Feuerbach).

4. The absence of muscle, joint and other sensations. The presence of some of these in certain cases of perception and the presence of others in reflection, recollection, etc., is manifest.

5. The sudden introduction into consciousness of an object by association of ideas, which object does not in the case in question properly belong to the object perceived, or to its present surroundings. By this it is known that the object perceived is known again. According to common parlance, in certain cases we must have seen that thing before, because we know its former surroundings (N. B. Recollection of a forgotten word or name). This characteristic is one of very frequent occurrence. In the *Cornhill Mag.*, Vol. XLI, p. 427, Art. "Illusions of Memory," there is a reference to this: "How many have been disappointed in revisiting old scenes to find the old, expected charm lacking! Things are not as they were. For instance, a person recalls a hill near the home of his childhood, and has the conviction that it was of great height. On revisiting the place he finds that the eminence is quite insignificant. How can we account for this? For one thing, it is to be observed that to his undeveloped childish muscles the climbing to the top meant a considerable expenditure of energy, to be followed by a sense of fatigue. The man remembers these feelings, and unconsciously reasoning by present experience, that is to say, by the amount of walking which would now produce this sense of fatigue, imagines that the height was vastly greater than it really was. Everybody knows the tendency to exaggerate the impressions of early life, as youth is the period of novel effects, when all the world is fresh and vivid, and new and striking impressions crowd in thickly on the mind. Who has not felt an unpleasant disenchantment in revisiting some garden or park that seemed a wondrous paradise to his young eyes? Past ideals, rosy and fresh, when once more seen, take on a ghastly hue."

6. The great rapidity and often surprising ease and quickness of the act of perceiving, due to preceding practice, dreams, perception, etc. Often a second idea-presentation of the object arises immediately after the perception. This characteristic is certainly one of the chiefest in recognition, including of course those cases of strange familiarity cited at the beginning of this article.

Dreams, preperception, former thought, all leave behind, on the physiological side, dispositions to be excited again in the same manner, and when a part or parts of similar thoughts again arise, there follow at once the former associations. Hence one of the characteristics by which we judge that we have seen this thing before. This has a great practical importance for the provinces of literary, scientific and art criticism. A critic believes that the new book which has been laid upon his dissection table has been already read by him; another believes even to recognize the verses which he reads for the first time. Another knows beforehand the conclusion of a novel; another again finds a new philosophical system old in all its parts—a thing easily understandable. Who has not heard of Oskar Blumenthal's "Aehnlichkeitsjäger," who hear in every note of music agreements or coincidences with well-known compositions. Dreams have quite obviously a telling effect here.

Waking imagination is another source of these "illusive" recollections. In certain morbid conditions of mind, and in the case of the few healthy minds endowed with special imaginative force, the products of this mental activity closely resemble dreams in their vividness and apparent actuality. When this is the case, illusions of memory may arise at once just as in the case of dreams. This will happen more easily when the imagination has been for some time occupied with the same group of ideal scenes, persons, or events. To Dickens, as is well known, his fictitious characters were for the time realities, and after he had finished his story, their forms and their sayings lingered with him, assuming the aspect of personal recollections.

Wigan's case ("Duality of Mind," 85 ff.) is a good exemplification of the point in question. "The strongest example of this delusion I ever recollect in my own person was on the occasion of the funeral of the Princess Charlotte. The circumstances connected with that event formed in every respect a most extraordinary psychological curiosity, and afforded an instructive view of the moral feelings pervading a whole nation and showing themselves without restraint or disguise. There is, perhaps, no example in history of so intense and so universal a sympathy." After describing the universal sympathy and grief, its causes, and how it infected everybody, he proceeds as follows: "I had obtained permission to be present on the occasion of the funeral as one of the lord chamberlain's staff. *Several disturbed nights previous to that ceremony, and the almost total privation of rest on the night immediately preceding it, had put my mind into a state of hysterical irritability, which was still further increased by*

grief and by exhaustion for want of food, for between breakfast and the hour of interment at midnight, such was the confusion in the town of Windsor that no expenditure of money could procure refreshment.

"I had been standing four hours, and on taking my place by the side of the coffin, in St. George's chapel, was only prevented from fainting by the interest of the scene. All that our truncated ceremonies could bestow of pomp was there, and the exquisite music produced a sort of hallucination. Suddenly, after the pathetic "Miserere" of Mozart, the music ceased, and there was an absolute silence. The coffin, which was placed on a kind of altar covered with black cloth (united to the black cloth which covered the pavement), *sank down so slowly through the floor that it was only in measuring its progress by some brilliant object beyond it that any motion could be perceived. I had fallen into a sort of torpid reverie*, when I was recalled to consciousness by a paroxysm of violent grief on the part of the bereaved husband as his eye suddenly caught the coffin sinking into its black grave formed by the inverted covering of the altar. In an instant I felt not merely an *impression*, but a *conviction*, that I had seen the whole scene before on some former occasion, and had heard even the very words addressed to myself by Sir George Naylor."

I have italicized certain lines of this well-delineated case, lines which indicate, along with other points brought out in this essay, the explanation of the phenomena in question.

Lalande ("Sur les paramnesies," *Rev. Philos.*, XXXVI, 485-497) rightly remarks that the paramnesia can possibly be produced by the very peculiar and almost indefinable acceleration of speed which the perception at the moment takes on. Before reading this and since, I have endeavored to study carefully every instance in my own experience of this feeling of strange familiarity often displayed in recognition, and I find in the majority of cases this peculiar acceleration as the chief characteristic, together with a rapid second idea-presentation of the object perceived. Persons in a low, nervous state of health, and others afflicted with epileptic tendencies, are often subject to this feeling, because of the unforeseen, unlooked-for rapidity of the nervous impulses underlying many of their perceptions. Arbitrary, involuntary, impulsive nerve movements are thus the primary causes of these phenomena. The patient acts as usual in classifying the phenomena as familiar and known-again; the mechanism is, however, acting unusually.

Vivid dreams leave their strong after-effect upon our waking thoughts. How hard it is sometimes to shake off the impression left by a vivid dream that a dead friend has

returned to life ! During the day that follows the dream, we have at intermittent moments something like an assurance that we have surely seen the departed one ; and though the impression is immediately corrected by reflection, it tends to revive within us with a strange pertinacity. It is highly probable that our dreams are thus, to a large extent, answerable for the sense of familiarity that we sometimes experience in visiting a new locality, or in seeing a new face.

Although we are not here concerned with time calculations, it may be well to quote the following from Oliver Wendell Holmes in his essay, " Bread and the Newspaper " : " When any startling piece of war news comes, it keeps repeating itself in our minds in spite of all we can do. The same trains of thought go tramping round in circle through the brain, like the supernumeraries that make up the grand army of a stage show. Now, if a thought goes round through the brain a thousand times in a day, it will have worn as deep a track as one which has passed through it once a week for twenty years. This accounts for the ages we seem to have lived since the twelfth of April last, and, to state it more generally, for that *ex post facto* operation of a great calamity, or any very powerful impression, which we once illustrated by the image of a stain spreading backwards from the leaf of life open before us through all those which we have already turned."

7. Frequently, after an object has been quickly perceived, there arises a feeling of *hindrance*, where some expected associated presentations do not arrive. Hughlings-Jackson (" On Intellectual Aura," *Brain*, 1889, 179 ff.) says in this connection, " I have been struck by certain non-associations." And James (" Principles," I, 252 and 673 ff.) writes : " There are cases where too many paths, leading to too diverse associates, block each other's way, and all that the mind gets along with its object is a fringe of felt familiarity or sense that there *are* associates. A similar result comes about when a definite setting is only nascently aroused. We then feel that we have seen the object already, but when or where we cannot say, though we may seem to ourselves to be on the brink of saying it. That nascent cerebral excitations can affect consciousness with a sort of sense of the imminence of that which stronger excitations would make us definitely feel, is obvious from what happens when we seek to remember a name. It tingles, it trembles on the verge, but does not come. Just such a tingling and trembling of unrecovered associates are the penumbra of recognition that may surround any experience and make it seem familiar, though we know not why."

8. Often a feeling of pleasure upon perception of an object, the cause of the pleasure being hardly known.

These characteristics are not supposed to be completely enumerated, nor given in the order of their importance. In themselves they are not recognition. Moreover, an object may be perceived and anyone of these characters may possibly accompany that perception, but that will not constitute a recognition. There must be a classification as known-again.

6. *The Classification.*

At some early period in life there arose the distinction between perceptions and centrally excited presentations, or what are generally called ideas. If the child's environment had always been the objects *a, b, c, d* and *e*, there would have arisen invariably the concomitant perceptions *a, b, c, d* and *e*; but the case not being so, the time comes when the child's brain becomes so formed that upon perception of *a, b*, there may be absence of the external realities *c, d* and *e*, the child, however, because of its already formed association-paths, having the images or ideas of *c, d* and *e*. Gradually it learns to know that when it has certain characteristically formed presentations, faint, dim, etc., there are no corresponding external realities. There arises a classification of presentations. The ideas, like the perceptual presentations, are simply object-knowledge; when their characteristics are noticed and the presentations classified, there arises a distinction. Some fresh, full, vivid, steady in their spatial localization, etc., are called *objects present*; others, with the opposite characteristics, are called *objects known-again*. This, as far as I can see, is a simple classification, like that of certain sensations, into color sensations and sound sensations.

I emphasize the point again: it is not a classification of *perceptions present* and *perceptions known-again*; it is *objects present* and *objects known-again*. This confusion has caused volumes of error and misconception. Perceptions, when they once pass out of consciousness, are never known again, for they no longer exist. Recognition has appeared a very mysterious thing because of this fundamental error.

Prof. James ("Principles," I, 648) writes: "Memory proper, or secondary memory as it might be styled, is the knowledge of a former state of mind, after it has already once dropped from consciousness; or rather, *it is the knowledge of an event or fact of which, meantime, we have not been thinking, with the additional consciousness that we have thought or experienced it before.*" As the facts appear to me, there is no alternative here at all. The first part of the statement is

absolutely incorrect. An act of memory is not correctly described by saying that it is knowledge of a former state of mind. The former state of mind is irremediably gone forever, and *it* we can never know again. The *object*, however, of which it was a knowledge can be known again, and that is the testimony of consciousness. James quotes Ladd as saying ("Physiol. Psych.," Pt. II, chap. x): "It is a fact of consciousness on which all possibility of connected experience and of recorded and cumulative human knowledge is dependent that certain phases or products of consciousness appear with a claim *to stand for (to represent)* past experiences to which they are regarded as in some respect similar. It is this peculiar claim in consciousness which constitutes the essence of an act of memory," and asks why, instead of the italicized words "*to stand for (to represent)*," Ladd should not use the word "*know*," thus implying that one can know our past experiences. James' final dictum is that "the past is known," and that "the straightest and shortest way of saying it is the best" (p. 689)—certainly a suicidal policy if it denies the facts.

Ladd speaks of "that peculiar and mysterious *actus* of the mind, *connecting* its present and its past, which constitutes the essence of memory." A Gordian knot, truly, if the facts were such as they are represented to be. Hence *past* feelings and experiences no longer exist, and they are hence no longer "*connected*" by "that peculiar and mysterious *actus* of the mind," nor does consciousness assert that the past experiences are known or are connected with the present experiences. Centrally excited presentations of objects once perceived may arise, but they are *not* the past experiences or knowledge of past experiences. They are a re-knowing of the same object. For the person concerned, they become memories by a classification based upon certain characteristics.

What is meant, it may be asked, by the oft-repeated phrase, "referring a fact to the past"? I have a remembrance now of sitting at the window yesterday and looking at a funeral passing slowly down the street. In this act of memory I do not "know the past," as affirmed by Ladd, James, *et al.*; there are, on the contrary, visual presentations of myself sitting at the window, the street and the long line of passing carriages. Similar presentations to those of yesterday pass through my mind. There then follow knowledge of certain characteristics and the classification. The "referring a fact to the past" would then mean the thinking or presentation of that object, fact, or event *with* the objects and events associated with it and the classification as known again.

Furthermore, the introduction of associated objects, as described in the fifth characteristic, does not of itself constitute memory, nor is it always an integral part of memory. Christian Wolf (*Psychologia Empirica*, S. 174, quoted by James) writes: "Suppose you have seen Mevius in the temple, but now afresh in Titus' house. I say you *recognize* Mevius, that is, are conscious of having seen him before, because, although now you perceive him with your senses along with Titus' house, your imagination produces an image of him along with one of the temple, and of the acts of your own mind reflecting on Mevius in the temple. Hence the idea of Mevius which is reproduced in sense is contained in another series of perceptions than that which formerly contained it, and this difference is the reason why we are conscious of having had it before. . . . For whilst now you see Mevius in the house of Titus, your imagination places him in the temple, and renders you conscious of the state of mind which you found in yourself when you beheld him there. By this you know that you have seen him before, that is, you recognize him. But you recognize him because his idea is now contained in another series of perceptions from that in which you first saw him." This describes rather well one of the grounds or characteristics upon which the classification is based, but it is not of itself recognition. James writes (p. 657): "It is the *setting* of the idea, when it recurs, which makes us conscious of it as past." The following statement is, however, not wholly correct: "The only hypothesis, in short, to which the facts of inward experience give countenance is that *the brain-tracts excited by the event proper, and those excited in its recall, are in part different from each other*. If we could revive the past event without any associates, we should exclude the possibility of memory, and simply dream that we were undergoing the experience as if for the first time."

The added or differing associates in themselves are no memory. They are like the object proper, simply further object-consciousness. They may, however, act as one of the *characterization-causes* of the ensuing classification.

Furthermore, it may be added that there is in recognition no "identification of the past impression with the present one." We do not perceive the "sameness, similarity and identity" of the two. Recognition can take place without a second presentation of the same object, as has been shown above, where the characteristic upon which the classification is based may be in certain cases only the acceleration of the perception, or the faintness of the idea-presentation, or an accompanying pleasure-feeling. There would be in these

cases of recognition no comparison of present impression with past ones at all. If this be so, then the latter part of Stumpf's statement is not true. "*Die vielen neueren Untersuchungen über das 'Wiedererkennen' beachten nicht eine Mehrdeutigkeit des Ausdrucks. Zuweilen bedeutet es nur 'wiederholtes Erkennen' und dann involvirt der Akt keine Vergleichung. In anderen Fällen bedeutet er 'Erkenntniss der Gleichheit oder gar der realen Identität eines Gegenwärtigen mit einem Vergangenen' und dann involvirt er natürlich eine Vergleichung'*" ("Tonpsychologie," Bd. II, S. 7).

Moreover, we can never be absolutely sure that our classification of an object as *known-again* is absolutely correct. The characteristic may attach itself to certain presentations to which it normally or usually does not belong. Hence arise our *illusions of recognition*. The robber disappears into the darkness of the night, leaving some footprints behind him; bring the robber back, compare the prints with the robber's boots, and we may have a moral certainty that we have the same robber. In the case of recognition we can never bring back the former impression.

Thus we return to our starting point, the strange sense of familiarity and the phenomena of paramnesia. These phenomena of familiarity and paramnesia are certainly cases of the general process of recognition, and are to be explained in the same manner. They are parts of a general whole. The names given to these phenomena are many, as, for instance, "double memory," "dreamy states," "preternatural presentiments," "mental mirages or *Empfindungsspiegelung*," "reminiscence," "pseudo-reminiscences," and the "indescribable been-here-before feeling" of daily life.¹ They occur in both our normal and abnormal life, although they probably occur more frequently as pathological cases. It is certainly not uncommon among the epileptic,² and cases are reported in other forms of insanity. It is also very often connected with a fatigued and wearied state of the bodily system. Dreams, whether the "half-dream conditions" described above, or day-dreams, or reveries, or the dreams of sleep, give rise very often to one or more or similar characteristics (as described above) upon which the classification is founded. Preperceptual mental activity and that kind of mental presentation often called "unconscious" because unaccompanied by attention, give rise to one or more of the characteristics. Thus in the case of Wigan, cited above,

¹ For literature and cases, see Prof. W. H. Burnham in this JOURNAL, Vol. II, pp. 439-464.

² See Hughlings-Jackson, "Intellectual Aura," *Brain*, July, 1888; Neumann, "Lehrbuch der Psychiatrie," S. 112, and others.

and which deserves careful study, there were plainly several of these factors at work. In our general normal life, our dreams may have been very vivid, but, perhaps, in our daily life forgotten, crowded out by the stress and strain of other things. In a moment of fatigue or weariness, when the bodily tension and normal coördinated strain are loosened, the nervous impulses may be more jerky and, so to speak, more unaccountable. There then arises suddenly, by the machinery of the association of ideas, a vivid and belief-compelling ideapresentation or a warm feeling of pleasure, which really has no connection with the perceived object *A*, which is not given by the context of surrounding objects. Upon this characteristic there immediately arises the classification of known-againness. These unforeseen, unlooked-for associates are apt especially to come to the front in the approach to and in great nervous disorganization, as in cases of fatigue, weariness, epilepsy, *dementia paralytica*,¹ etc. Hence it is that it is sometimes a characteristic for the physician's prognosis and diagnosis of these diseases. Apropos of this I may cite from Burnham (*loc. cit.*, pp. 442-4): "Kraepelin cites two cases of epilepsy where the patient had this form of paramnesia. Hughlings-Jackson has reported several cases where, in the 'intellectual aura' or 'dreamy state,' false memories occurred. One of the most important of his cases is that of a highly educated physician who is subject to attacks of *petit mal* and *haut mal*. In his report of his own case this gentleman mentions illusions of memory in the initial stages, both of *petits maux* and *hauts maux*. Speaking of his mental condition in the former, he says: 'In a large majority of cases the central feature has been mental and has been a feeling of recollection, *i. e.*, of realizing that what is occupying the attention is what has occupied it before, and indeed has been familiar, but has been for a time forgotten, and now is recovered with a slight sense of satisfaction, as if it had been sought for. My normal memory is bad, and a similar but much fainter feeling of sudden recollection of a forgotten fact is familiar. But in the abnormal states, the recollection is much more instantaneous, much more absorbing, more vivid, and, for the moment, more satisfactory, as filling up a void, which I imagine at the time I had previously in vain sought to fill. At the same time, or, perhaps I should say more accurately, in immediate sequence, I am dimly aware that the recollection is fictitious, and my state abnormal.'

"In another case reported by Ferrier, a woman had attacks

¹Kraepelin found simple paramnesia a very characteristic accompaniment of *dementia paralytica*. *Archiv f. Psych.*, Bd. XVII and XVIII, *Ueber Erinnerungsfälschungen*.

of *le petit mal* that were divided into three distinct stages, of which 'the first stage is a dreamy state or reminiscence, in which everything around her seems familiar or to have happened before.'

"Several years ago, another physician, subject to attacks of epilepsy, suggested that this form of paramnesia might serve as prognostic of epilepsy. In his own case he came to treat the experience 'as an indication for immediate rest and treatment.' Apropos of this case Hughlings-Jackson says: 'I should never, in spite of Quaeren's case, diagnose epilepsy from the paroxysmal occurrence of 'reminiscence' without other symptoms, although I should suspect epilepsy if that super-positive mental state began to occur very frequently, and should treat the patient according to these suspicions were I consulted for it.' He emphasizes, however, the advantage of noting this phenomenon as a possible symptom of epilepsy."

Probably the larger part of the cases of paramnesia reported have been epileptics. Jensen reports the case of a patient complaining to him, "Doctor, I feel so very strange to-day. When I stand now like this and look at you, then it seems to me as if you had stood there once before, and as if everything had been just the same, and as if I knew what was coming; and when I think about it, I get so frightened (*schucherich*, a word used by the patient to designate the attacks), and I go back and turn around; and when it is over, the whole thing seems so ridiculous—and it has been so all the time to-day—I don't know what ails me." On finishing these words the patient immediately had an attack.¹

In normal life this recognition-illusion is immediately corrected. The association paths are traversed by nervous impulses in the customary way. In the abnormal state of weariness, epilepsy, etc., the impulses are unusually rapid and freaky, if I may use the word. There is a nervous jerkiness which produces unwonted, unlooked-for associates. Hence arise those characteristics mentioned above in unusual or abnormal association with the perceived objects. It depends upon the condition of the patient's nervous system whether and how soon the illusion will be corrected. In dreams, which may be designated pathological associational mental life, the illusion is seldom corrected, the normal associations of the wide-awake life fail to put in an appearance, thus leaving the nervous impulses to a sort of arbitrary play. In cases of acute paramnesia, it is impossible often to cure the patients of their delusions.

¹ Vide Burnham, *loc. cit.*, p. 459.

The ease and quickness of these cases of recognition have been a prominent feature in my experiences. The rapidity with which an object has been perceived, and the surprising immediacy and celerity with which the same object, or some apparent associate, arises at once after the perception of the object, have been to me, at least, the chief and most frequently occurring characteristics upon which the classification has been based. I speak now especially of the abnormal cases of recognition, *i. e.*, those of paramnesia. This again finds its easiest explanation in unusual excitability, irritability and jerkiness of movement in the central nervous impulses, involved in the machinery of the association of ideas. Prof. Burnham (*loc. cit.*, p. 447 in a note) writes that "a fellow-student of psychology . . . has often observed this form of illusion in his own dreams, and thinks they generally occur in morning dreams. The over-rested condition of the nerve centres may, he thinks, explain this phenomenon. When we see a strange object, its unfamiliar aspect is largely due to the difficulty we find in apperceiving its characteristics. The process of becoming acquainted with a thing consists in making the act of apperception easy. Hence, when the brain centres are over-rested, the apperception of a strange scene may be so easy that the aspect of the scene will be familiar. The fact observed by Anjel that this illusion is apt to occur in conditions of fatigue, does not necessarily conflict with this explanation. In the cases observed there may have been an abnormal ease of apperception due to hyperæsthesia induced by the fatigue. It may be added that Bonatelli thinks that illusions of memory occur in states of unusual nervous irritability. Such, in his opinion, would be the condition in vivid dreams, and in the unusual circumstances of journeys and the like."

PSYCHOLOGICAL LITERATURE.

I.—NEUROLOGICAL.

Experimental Degenerations Following Unilateral Lesions of the Cortex Cerebri in the Bonnet Monkey (Macacus Sinicus). E. LINDON MELLUS, M. D. Proc. Royal Soc., LVIII, pp. 206-14. 1895.

Physiologically, by direct stimulation of the cortex, it is impossible to do more than follow out a few of the main lines of relation between the cortex and the muscular system. By cutting away the cortex and applying the stimulus to the fibres of the corona radiata of internal capsule or to the columns of the medulla or spinal cord, this method has also succeeded in tracing, after a fashion, the paths of motor fibres through different levels of the central axis. At best, however, results of this method lack precision. The anatomical method, depending on degenerations following a lesion, especially as now developed by Marchi, has made it possible to follow the course of nerve fibres with great accuracy. The present research has for its object to trace by Marchi's method all the fibres which arise in a small region of the cortex to their destinations in the cerebrum, medulla and spinal cord.

Fourteen successful operations are recorded, of which three are lesions of the hallux centre, four of the thumb centre and seven of four different centres in the facial area. These centres were first located by stimulation, and then a portion of the cortex, about 16 sq. mm., was cut out to its full depth. Each class of experiments is treated by itself in detail with the comparison of the results of each experiment in the class. For these details the reader is referred to the original paper. The more striking general results of the entire series of experiments may be summarized as follows.

From the lesion as a centre, degenerated fibres spray out in all directions to associated regions of the same hemisphere. These decrease quite uniformly in number with the distance from the lesion and do not cover so large a region as might be expected from current ideas regarding association fibres. For the above lesions they are confined to the central convolutions. In harmony with the observation of Bevan Lewis, that the cells of the fourth layer are large in the upper portions of the motor areas and small in those farther down toward the base of the brain, Mellus finds that the fibres that pass down are fine, while those that pass upward from the lesion are coarser. According to the individual lesion, either fine fibres or both fine and coarse fibres pass through the corpus callosum, or posterior commissure, to distribute themselves over an area in the other hemisphere very similar in outline to the area of degenerated fibres on the side of the lesion. To give the course of the degenerated fibres in the internal capsule, which is of

especial importance, I will quote from the author's summary. He says: "All the degenerated pyramidal fibres from the hallux and thumb lesions were found to enter the capsule at or near the posterior extremity, while the corresponding fibres from the facial lesions entered the capsule at or near the anterior extremity, and the former were displaced forward and the latter backward until in the lower levels of the capsule they all found a place in the middle third of the posterior limb. It is also shown that a line can be drawn from the fissure of Sylvius upward, so dividing the motor area into two parts that all the facial lesions from which fibres enter the anterior portion of the capsule would be in the anterior division, and all the hallux and thumb lesions from which fibres enter the posterior portion of the capsule would be in the posterior division. In the movement of the facial fibres backwards between the upper and lower levels of the capsule, they would necessarily, at some level, envelope the genu, which would account for the fact that they have always been described as occupying that position. These results correspond closely with those obtained by Beever and Horsley by direct stimulation of the internal capsule in the same animal. As to the further course of the degenerated fibres, a large part of the fine fibres can be traced into the outer surface of the optic thalamus, and farther down, coarse fibres, which resemble in size and position true pyramidal fibres, pass as far as can be determined into the *substantia nigra*. These fibres going to the *substantia nigra*, moreover, about equal in number those passing down in the pyramids. In three of the facial lesions and in one thumb lesion, no other degeneration can be traced in the internal capsule than the stream of chiefly fine fibres to the thalamus and that of coarse fibers to the *substantia nigra*, no connection being demonstrable between the cortex and the facial nuclei or the motor nuclei in the cord. In all the other experiments, however, these relations are manifest.

A result of immense importance to the subject of bilateral control of the spinal cord by each cerebral hemisphere is clearly demonstrated for the first time in the monkey, though formerly shown to exist in the dog by Muratoff. Sherrington had noticed degenerated fibres in both crossed pyramidal tracts, and advanced the rather clumsy theory that after decussating in the medulla, these fibres recrossed at lower levels of the cord. The fact is that a considerable number of these fibres may remain upon the side of their cerebral origin not only in the anterior, but in the lateral pyramidal tract. Whether these finally cross at their terminations in the cord, as do the fibres of the anterior pyramidal tract, is not stated.

Another peculiar result found in three of the facial lesions is degeneration in the internal capsule of the side opposite to the lesion. All the lesions were made in the left hemisphere, and in these three cases the degeneration in the right capsule varied from one half to fully as much as occurred in the left capsule. The only way this could be accounted for on modern theories of degeneration would seem to be that these fibres crossed in the corpus callosum and passed down in the opposite capsule. As this cannot be shown to occur in the specimens, the fact must be left for the present unexplained.

By the courtesy of Dr. Mellus, the writer has seen the specimens and photographs from them and can testify that the above points are demonstrated in the most precise manner possible. There is every reason to hope that further work along this line which Dr. Mellus is undertaking will continue to yield most important results.

C. F. H.

Experimental Researches into the Function of the Cerebellum. J. S. RISIEN RUSSELL. Phil. Trans. Roy. Soc., 1894, II, pp. 819-61, 11 Figs. in text.

Degenerations Consequent on Experimental Lesions of the Cerebellum. J. S. RISIEN RUSSELL and A. W. CAMPBELL. Brit. Med. J., Lond., 1894, II, 640-42; also, Proc. Roy. Soc., LVI, 303-5. 1895.

A Clinical Study of a Cyst of the Cerebellum; Weakness of Spinal Muscles; Death from Failure of Respiration. J. S. RISIEN RUSSELL with J. HUGHLINGS JACKSON. Brit. Med. Journal, Lond., 1894, I, pp. 393-5.

The Value of Experimental Evidence in the Diagnosis of Diseases of the Cerebellum. J. S. RISIEN RUSSELL. Brit. Med. J., Lond., 1895, I, pp. 1079-82.

Defective Development of the Central Nervous System in a Cat. J. S. RISIEN RUSSELL. Brain, 1895, Lond., pp. 37-53, 10 Figs.

The cerebellum has been studied since Saucerotte with ever confusing and indefinite results. And it is only within the last two years that sufficient light as to its varied functions has been gained to place lesions of the cerebellum within the field of practical operative surgery. Much of the final work to this end has been accomplished by Dr. Russell, and is outlined in the above papers.

We are first treated to a brief review of the literature, including the recent work of Luciani, and from this is clearly seen the necessity of focussing experiment on the following seven points: 1. "Whether each lateral half of the cerebellum is capable of acting independently, or whether it is necessary for the connections between the two halves to be intact, in order that the functions of the organ should be properly performed." 2. "If impulses pass from one side of the organ to the other before they are transmitted to the cerebrum or spinal cord." 3. "What is the nature of the impairment of movement which results when portions of the organ are removed?" 4. "What relationship exists between one-half of the cerebellum and the cerebral hemisphere of the opposite side, and what is its probable nature?" 5. "Whether one lateral half of the cerebellum is related mainly to one side of the spinal cord, to the opposite side, or to both, and what the nature of the relationship is." 6. "What symptoms resulting from experimental lesions of the cerebellum are mostly to be relied on for localization?" 7. "Whether any, and if so, which, of the symptoms are dependent on interference with the labyrinth or eighth nerve when experimental lesions of the cerebellum are produced." The research is thus seven-fold, including all the difficult and disputed points of cerebellar physiology, and for each point a special line of experiments was planned. Most of the experiments were made upon dogs, results of these, however, being compared with those obtained from monkeys, and the case of a cat with defect in development of cerebellum sufficing to show very similar relations in this species.

Median section of the cerebellum, the line of experiment employed to prove whether the cerebellum acted as a unit or as a bilateral organ, caused remarkably little disturbance. This is taken to indicate, in contradiction to Luciani's reiterated dictum, "that the cerebellum is a unit; that one-half of the cerebellum does not, in any great measure, depend on the coöperation of the other half for the proper performance of its functions. The bulk of the impulses pass from one-half of the organ to the cerebrum, or to the

spinal cord, without passing to the other half." Thus this refractory part falls into line with all the other parts of the nervous axis as a bilateral organ, and a foothold is gained for the experiments to follow.

The most important results touching the relations of the cerebellum to the cerebrum on the one side and to the spinal cord on the other, are thus naturally given by ablation of one lateral half of the organ. A striking result of this operation is shown in the increased excitability of the opposite cerebral hemisphere. Tested with the faradic current, with cerebellum intact, both hemispheres are equally excitable. After ablation of one-half of the cerebellum the opposite hemisphere becomes much more excitable, and continues so for at least three months after the operation. This is also clearly demonstrated by the administration of absinthe, the contractions occurring during the epileptic seizures being enormously greater on the side of the ablation, while it was also clear that the convulsions on the other side were diminished. Furthermore, the character of the convulsions on the two sides tends to become different, in intact animals the characteristic tonic contractions tending strongly to become clonic upon the operated side. The tracings taken from several experiments and reproduced in the first paper noted show these differences in a striking manner.

Impairment of movement occurs after unilateral ablation. This Luciani explains as due to his three factors, astasia, asthenia and atonia. Russell also distinguishes three factors, which he names incoördination, rigidity and motor paresis. The two former conditions would seem to be due chiefly to the increased excitability of the opposite cerebral hemispheres; the paresis, as the author states, is "probably directly due to the withdrawal of the cerebellar influence from the muscles." The chief result of this line of experiments is that "the one-half of the cerebellum controls the cells of the cortex of the opposite cerebral hemisphere, and those of the anterior horns of the spinal cord on the same side chiefly, and on the opposite side to a slight extent." Thus, while the cerebrum has chiefly a crossed relation to the body, the relation of the cerebellum is mainly direct.

The symptoms characteristic of unilateral ablation of the cerebellum are summarized as follows: 1. Rotation and reeling to the opposite side. This is a prime symptom, and is the exact opposite of the results of most other observers, who state that the reeling is toward the side of the lesion. Further, when describing the phenomenon in an affected person, Dr. Russell clearly indicates that "the turning is toward what I should call the side of the lesion." For right unilateral ablation the rotation is that of a "cork-screw going into a cork;" for left ablation, that of a "cork-screw coming out of a cork," that is, to the right for right lesion and to the left for left lesion. Attention has been called to this apparent discrepancy, and Dr. Russell has rejoined that he intends clearing up the matter in a special paper.

Among the other symptoms, the face on the affected side is turned upward and the spinal column is convex on the side of lesion; and there is incoördination, rigidity, especially of the fore limb, exaggeration of tendon reflexes, motor paresis, anæsthesia and analgesia, the three latter also affecting the posterior extremity of the opposite side. The opposite eyeball deviates downwards and outwards, while that of the same side, if abnormal, turns upwards and to the affected side. Nystagmus also occurs, in which the jerks are toward the side of lesion.

The general result of the whole research is that instead of considering the cerebellum as a distinct organ and trying to prove

a distinct function for it, we should treat it as a part of the great central axis, which coöperates with many other parts in the performance of many different functions, the chief difference between one part of this great system and another being the degree in which different functions are represented in any given part: *e. g.*, with regard to motor power, the anterior extremity is maximally represented in the cerebrum and minimally in the cerebellum, whereas the trunk muscles are minimally represented in the cerebrum and maximally in the cerebellum. The disturbances of eye movements, which Luciani considered "irritative," Russell would make paralytic. Experiments in various ways on the auditory nerve and labyrinth prove that disturbances in this region are different from those arising from cerebellar lesion.

The whole clinical bearing of his investigations, together with references to a number of clinical cases, is discussed in the papers referred to in the *British Medical Journal*.

Degenerations following removal of various parts of the cerebellum, especially those occurring after unilateral ablation, are of especial interest as confirming or failing to confirm the results of Marchi, Ferrier and Turner. "Removal of one lateral lobe of the cerebellum results in degeneration of all the peduncles on the side of the lesion, and in the superior peduncle of the opposite side. The degenerated fibres in the superior peduncle on the side of the lesion decussate in the posterior quadrigeminal region, and pass to the opposite red nucleus and optic thalamus. None could be traced beyond this point." The degenerated fibres in the opposite superior peduncle came from the region of the cut, and occurred in both superior peduncles after median section. This is taken to controvert Marchi's statement that none of the peduncles contain commissural fibres. The degenerated fibres of the middle peduncle pass to the gray matter of the opposite side of the pons. Marchi's result that fibres from this peduncle pass in the fillet and posterior longitudinal bundle to the corpora quadrigemina, in the pyramids to the corpora striata, or to the roots of the cranial nerves, is not confirmed. Fibres degenerating in the inferior peduncle occupy the lateral region of the medulla, thinning out rapidly as they pass down. A few scattering fibres can be traced in the antero-lateral region of the cervical cord, where all signs of degeneration cease. Degenerated fibres pass in this peduncle to both inferior olives. Russell confirms Marchi, contrary to the results of Ferrier and Turner, in demonstrating degenerated fibres in all the peduncles after excision of the middle lobe. Ferrier and Turner, on the other hand, are confirmed against Marchi in not finding any antero-lateral tract degenerated throughout the length of the cord, where only the cerebellum is injured.

In this connection it is of interest to note that Campbell's findings in several human cases (*Brit. Med. Jour.*, part of Russell's paper) gives the startling result of degeneration downward in the direct cerebellar tract in unilateral lesion of the cerebellum. In the cat, too, with defective development of the right lobe of the cerebellum, deficiency also occurs in the corresponding direct cerebellar tract. Attention was called to this animal by its resemblance to Dr. Russell's dogs with unilateral ablation of the cerebellum. The post mortem examination fully confirmed Russell's diagnosis, the right lobe of the cerebellum being scarcely one-third the size of the left. This case furnishes, among others, one other point of especial interest. Whereas the right cerebral hemisphere is but slightly smaller than the left, the right crus is very small and completely disappears in the upper levels of the pons, so that no trace

of a right pyramid is observable in the medulla. At the usual level the left pyramid divides, as in some of Mellus's cases, the greater part passing to the right side, about a fifth remaining on the left side. The striking point, however, is that the cord below the decussation very soon comes to present perfectly normal pyramidal tracts. It is difficult to explain how this can happen on any other assumption than that some, and it would seem the larger part, of the pyramidal fibres really arise in the cord, and not in the cortex, as is usually taught.

We are certainly indebted to Dr. Russell for a vigorous stirring of these already troubled waters, and there appears to be good reason to hope that they will clear into a much better anatomy and physiology of this difficult region than we have had heretofore.

C. F. H.

An Experimental Investigation of Eye Movements. J. S. RISIEN RUSSELL. *Journal of Physiology*, XVII, Nos. 2 and 3, pp. 1 to 27, 3 Figs. in text.

A serious difficulty in the localization of eye movements in the cerebral cortex has been the fact that only lateral movements have been obtained from cortical stimulation. Hughlings Jackson recently made the suggestion that the absence of other movements might be accounted for by the degree of representation of the various movements in the same general centre, the lateral movements of the eyes being predominantly represented over the area for control of the eyes. If this supposition be correct, by excluding these movements, cutting the lateral recti, it ought to be possible to obtain other movements on stimulating the motor eye centres. An experimental test of this suggestion in the hands of Dr. Russell proved Jackson's view to be correct, and this result cannot fail to exert a widespread influence upon general theories of cerebral localization. Beyond this point Dr. Russell discusses the relative control of the eyes by the cerebellum and cerebrum.

By cutting the external rectus of one side and internal rectus of the other, and stimulating the cortex of the side with the intact recti, the possibility of lateral movements was excluded and practically all the other movements of the eyes were obtained, viz., direct downward and upward rotations, rotations downward and to the opposite side and upward and to the opposite side, and occasionally also convergence, were obtained, each corresponding to a more or less clearly defined cortical area.

Ocular deviations artificially produced in dogs by ablation of the whole or part of the cortical area for eye movements on one side are recovered from in time, but reappear in narcosis, to be lost again in the total paralysis of the eye muscles normally occurring in the deeper states. Explanations founded on hypertrophy of residual cells, cerebellar compensation and compensation by the other hemisphere are suggested, but none is supported to the exclusion of the others. Careful control experiments on normal dogs were conducted to exclude false results.

Extirpation of one lateral half or part of one lateral half of the cerebellum produces downward and variable outward rotation on the opposite side. Total excision produces a downward and slightly outward rotation of both eyes. All experimentally induced rotations ultimately disappear, but may be caused to reappear in narcosis. Nystagmus is generally also present with slow jerking movements immediately after lesions, or, in cases of total extirpation, accompanying, and in the same direction as, voluntary move-

ments. This latter paralytic form, like the deviations themselves, gradually disappears, to reappear only in the first stages of narcosis. Control experiments on the labyrinth and eighth nerve do not overthrow the conclusions regarding the cerebellar influence upon eye movements.

Experiments consisting of ablations of cortical and cerebellar areas simultaneously and in sequence seem to show that one lateral half of the cerebellum and the opposite cortical centre exert a combined influence tending to move the eye in one direction, while the other lateral lobe and the other hemisphere give movements in the opposite direction. These two influences are antagonistic: take away the whole of one and the other predominates; take away half of each and the remaining halves antagonize each other. The cerebellum seems further to exercise a direct action on the ocular muscles perfectly independent of cortical mediation.

C. C. STEWART.

Obere Schleife und Hirnrinde. DR. MAX BIELSCHOWSKY. *Neurolog. Centralblatt*, Vol. XIV, p. 205.

Ein Beitrag zur Lehre vom Schleifenverlauf (obere, Rinden, Thalamus-schleife). VON. DR. CHRISTFRIED JAKOB. *Neurolog. Centralbl.*, Vol. XIV, p. 308.

Sur les connexions du ruban de Reil avec la corticalité cérébrale. M. et Mme. J. DEJERINE. *Extrait des comptes rendus des séances de la Société de Biologie.* Séance du 6 Avril, 1895.

The discussion on the central termination of the sensory pathways seems to come nearer a conclusion. There were practically two views represented: Flechsig and Hösel maintain that fibres which come from cells of the nuclei of Goll and Burdach and form the interolivary stratum and the fillet, terminate in the parietal region of the cerebral cortex. Von Monakow and Mahaim, on the other hand, state that there is no direct connection between the fillet and the cortex, but that the connection is indirect, by means of the optic thalamus.

Bielschowsky examined two dogs' brains, in which Professor Goltz had removed one hemisphere with the corpus striatum in one case and both hemispheres with the corpora striata in the other. The first dog lived two years and five months after the operation, the second nine months after removal of one and two months after removal of the other hemisphere. In both dogs, the optic thalamus was not injured, but showed secondary atrophy (just as in Von Monakow's experiments); the fillet, however, was neither atrophic nor degenerated; hence the conclusion that the fillet is merely a connection between the nuclei of Goll and Burdach and the optic thalamus, and that a second nerve cell is needed for the connection between the optic thalamus and the cortex.

The greatest and most valuable material has been published by M. and Mme. Dejerine. They have no less than nine cases in which the fillet was involved, and nineteen cases in which the fillet might have been involved, if Flechsig and Hösel's views were correct. Their cases allow the following conclusions:

1. In two cases with a lesion of the nuclei of Goll and Burdach, there is (ascending) degeneration of the fillet; the degeneration cannot be followed beyond the subthalamic region and the inferior part of the optic thalamus.

2. In three cases the fillet is destroyed in the region of the pons. The consequence is a descending degeneration, involving the inter-

olivary stratum on the same side and the arcuate fibres and nuclei of Goll and Burdach of the opposite side,—and an ascending degeneration, which can be followed only as far as the anterior corpora quadrigemina and the inferior part of the optic thalamus, but leaves completely intact the fibres passing through the lenticular nucleus, the nucleus of Luys, the globus pallidus and the commissure of Meynert.

3. In four cases lesion of the region of the optic thalamus is followed by a slight atrophy of the mesial fillet, diminishing downwards as we approach the nuclei of Goll and Burdach. This atrophy belongs in the category of "atrophic cellulipète," described by Forel. There is no reason to believe that the cells of the fibres that atrophy apparently downward must be located in the thalamus; at any rate, most of the fibres of the fillet come from the cells of the nuclei of Goll and Burdach.

4. Among the nineteen cases of lesion of the motor and parietal area there is especially one which seems very conclusive. The whole external aspect of the left hemisphere and the orbital surface of the frontal lobe were softened; the central ganglia were, however, not involved. The patient had had right hemiplegia with total aphasia for eleven years. The secondary degeneration involved: the radiations of the thalamus, of the internal and external geniculate body, the fibres to the pons and medulla, the pyramidal tract, etc., a total degeneration of the internal capsule, of the crus cerebri, the locus niger and part of the red nucleus. With all this, the fillet was intact and also the aura lenticularis. A drawing in Dejerine's *Anatomie des centres nerveux*, Vol. I, p. 180, gives the whole plan of the sensory pathways as it follows from his cases.

Dr. Jakob's paper appeared before Dejerine's and adds another case in favor of Von Monakow's view; his remark, that the central sensory nerve cell might be located in the globus pallidus, cannot be upheld by facts, and does not invalidate the view of Von Monakow and Dejerine, which may be summed up as follows:

1. The periphery sensory element is a spinal ganglion cell.
2. The first central sensory nerve cell is a cell of the nuclei of Goll and Burdach, which helps in forming the fillet of the opposite side, and ends in the optic thalamus.
3. The higher central sensory nerve cell is situated in the optic thalamus and sends its process to the cortex of the parietal lobe.

ADOLPH MEYER.

Beiträge zur Kenntniss des Reichtums der Grosshirnrinde des Menschen an markhaltigen Nervenfasern. THEODOR KAES. *Archiv für Psychiatrie*, XXV, 695-758 Tafl. XIII, XIV, Berlin, 1893.

Ueber den Markfasergehalt der Grosshirnrinde eines 1 1-4 jährigen männlichen Kindes. THEODOR KAES. *Jahrbücher der Hamburg Staatskrankenanstalten*, IV, 1893-94. Hamburg und Leipzig, Leopold Voss, 1896.

Ueber Grosshirnrindenmasse und über Anordnung der Markfasersysteme in der Rinde des Menschen, zugleich ein Beitrag zur Frage: Unterscheidet sich die Rinde des Kulturmenschen von den niederen Rassen in Bezug auf Kaliber, Reichthum und Anordnung der markhaltigen Nervenfasern? THEODOR KAES. *Wiener Med. Wochenschr.*, 1895, No. 41 and 42.

Every attempt to discover the physical basis of intelligence in the gross characters of the brain, its size, weight, form or convolu-

tion, has led to no definite result. If such a basis is to be discovered, it must be sought in the minute structures of the cortex itself, and of all the cortical elements, possibly none could serve the purposes of an index so well as the medullated fibre plexuses chosen by our author. We may see the reason for this selection in the fact that as nerve fibres become functional, they become medullated, hence medullation may be taken as a fair measure of functional nerve paths, afferent, efferent, and associational, within the gray matter.

The methods employed are given in the first paper. The brain is partially hardened in Müller's fluid, then cut into twelve transverse slices of equal thickness; the hardening is completed in Müller's fluid and alcohol; a number of samples are taken from each slice, sections cut and stained by Wolter's (a modification of Weigert's) method. About 100 regions are examined in each hemisphere.

The first paper deals with the results obtained from the study of two brains, respectively eighteen and thirty-eight years old, from males dying of phthisis, this latter disease being selected because mental faculties are so well retained to the last. His gross result leads Kaes to differ decidedly from views usually accepted as to time of medullation of the cortex. Edinger states that differences of medullation cannot be followed after the third year; Obersteiner, that medullation seems to be about complete by the seventh year, while Kaes considers his results to prove that between the eighteenth and thirty-eighth year the medullation of the cortex has made enormous strides — "*noch gewaltig fortschreitet.*" It does not seem to occur to him that these differences may be accounted for by a great number of factors peculiar to the individuals other than age.

The study of fibre content of the infant's brain, as well as of all those that follow, was made by the same method, and is of especial value as giving us the different layers and plexuses in the process of forming. The brain weighed 1030 grammes, a little more than average for a child between one and two years, as usually stated. The author first discusses macroscopic methods of investigation. The color of the cortex will not serve, as in adults, where colors range from yellow through yellowish gray to gray, because the child's cortex is almost uniformly yellow. The color of the medullary core of the convolutions gives some insight into unfolding of a child's brain. In adult brains this stains black and deep-black, while in the child the tints vary from bright-gray, gray, dark, to black and deep-black. The relative percentages of these tints show that medullation (Projection + Meynert's *Fibræ Propriæ*) in the right hemisphere has proceeded farther than in the left. Comparison of mass of whole cortex and of different layers for the convex, median and under surfaces of a child's brain with that of eighteen-year and thirty-eight-year brains shows that the thickness of the cortex is greater in the child, which is due to the fact that the medullary substance is still growing up into the gray matter. The cortex in the sulci develops more rapidly than at the sides and top of convolutions. Thickness of cortex is greatest, however, on top of the convolutions and least in the sulci. In average breadth of projection bundle, medullary axis of the convolution, the child falls short of the adult by a small fraction of a millimeter. For details of development of different cortical layers, the original must be consulted. In all respects, the right hemisphere is better developed than the left. In this respect, the right convex surface leads, the occipital convolutions coming first, the central ranking next. Results of investigation of fibre content of different layers cannot

be briefly stated. The author considers, however, that the projection fibres form a fixed point, about which the whole central association system is built up. The *Fibræ Propriæ* antedate all other fibres in medullation and are prominent in regions otherwise poorly developed. In conclusion: The right hemisphere is more advanced in fibre development than the left, while in the adult the opposite is generally true. Right-handedness and the development of speech centre of the left hemisphere are given as reasons for the ultimate left-brainedness of adults. The right occipital region remains better developed because the bilateral use of eyes has not discriminated against it. Regions of the child's brain richest in fibres are the central, especially paracentral, with the occipital next in order; while the region poorest in fibres is the anterior part of the under surface near the insular convolutions. The report, besides charts giving fibre distribution in the cortex, contains several drawings of parts examined.

Too much importance seems to be given to the right-brainedness of the child. May not the case be exceptional, a tendency to left-handedness accounting for this variation? The reasons given for later prepotency of the left hemisphere, speech and right-handedness, seemed almost question begging, for we should naturally suppose that both of these must be determined by superior development of the left hemisphere.

In the last paper some inter-racial comparisons are made, the basis of which is the following series: The brains of eight male Germans, aged respectively 14, 18, 38, 41, 42, 45 (two) and 53 years, and one Hindoo and one Chinese, both male and aged about 40. Measurements of cortex, medullary substance and of each fibre plexus in the cortex are carried out with great precision and described in detail for each location. It is shown that the thickness of the cortex is greatest in a child. Decrease in thickness shows on the convexity until the eighteenth year, and on the other two surfaces until the thirty-eighth year. Later, there is an increase, which culminates about the forty-fifth year. At a given age the meagrely fibred parts of the cortex are thicker, while those regions rich in fibres are thinner. Of the dimensions of particular parts of the cortex, the author gives chief attention to the two groups of superradial and interradian fibres, respectively. While the interradian plexus in all three surfaces of the child's brain has reached almost the greatest thickness, which appears stable from thirty-eight years onward, the superradial system shows constant growth from eighteen to forty-five years, but does not continue beyond fifty. After discussing the relative distribution of the fibres in the two hemispheres, the author reaches the general conclusion that the cortical development from childhood to extreme age, for the whole cortical thickness as well as for the medullary substance and for the particular layers of the cortex, may be determined with great precision. As for the medullary substance, the greatest thickness corresponds to the most powerful fibre development. For the association systems of the cortex, the reverse is true. The stronger association development is connected with the thinner cortex. In adults the left convexity is thinner, but is richest in fibre development. The fact that the right is most strongly developed in the child accounts for the brief period of facility in use of the left hand, which, in the author's opinion, immediately precedes the prepotency of the right. Comparison with the Hindoo brain (average of Germans does not include the child's brain) shows that the thickness of the medullary core of the convolutions is less than in the Germans. This is true only of the under surface in the Chinese

brain. In general thickness of cortex, the Germans and Chinese are more nearly alike, while the Hindoo in both hemispheres approaches more nearly to the dimensions in the child. In superradial fibres, the Asiatics are behind the German average. Interradial fibres are about the same, or perhaps somewhat more developed in the Hindoo. The following seems to be the rule: The less a part of the cortex is developed in regard to fibre content, the more nearly the same are the averages of German and Asiatic. Smell and taste centres in *Gyrus Fornicatus* show less fibre development in the Germans than in the Asiatics. The chief difference between the Germans and Asiatics is perhaps as follows: The Chinese and Hindoos show luxuriant growth of interradian fibres, while in the Germans the more vigorous growth appears in the superradian fibres.

We are indebted to the author for a vast amount of work very carefully done; but from individual differences, which appear in his tables, we should think that general conclusions as to brain growth at different ages, and characteristic development of different races had better be deferred until a much larger number of brains have been examined.

E. H. LINDLEY.

The Sense Organs of Lumbricus Agricola (Hoffm). FANNY E. LANGDON. *Journal of Morphology*, XI, 194-232, Pls. XX, XIII and XIV, 2 Figs. in text. Boston, 1895.

In the total absence of any definite type of sense-organ, the sensitiveness of the earthworm to such various stimuli as light, taste, smell and touch has remained a standing puzzle. The older writers, beginning with Leydig and Schulze, and coming down to Mojsisovics and Ude in more recent years, did, it is true, give some ground of hope that the problem might find a solution in the discovery of a definite organ. Their authority, however, was about balanced by other investigators, who failed to find any trace of either structure or grouping indicative of special sensory functions among the epidermal cells. The matter seemed closed, when both Retzius and Lenhossék, employing most approved methods, declared against the presence of definite sense-organs. In the face of these authorities, however, our author is able to clear up the subject in a way that can leave no room for doubt.

The sense-organ of *Lumbricus* is shown to consist of a number of ganglion cells, arranged in oval groups very much like taste buds. From the distal end of each cell a sensory hair perforates the cuticle to the exterior, while from its central end arises a nerve fibre which passes with the sensory nerve trunk into the ventral ganglion of the same side and segment. The size of the organs, 100 by 60 μ , as well as their number, averaging 1,000 to each segment, make it doubly remarkable that they have been overlooked so long. Plate XIV presents us with camera drawings of the sensory spots as seen on the cuticle of a specimen for characteristic metameres. From this it appears that the organs are in general scattered irregularly over the surface, somewhat more numerous on the cephalic than caudal half of the segment, and more numerous near the extremities than in the middle of the body. No differentiation of organs for different senses has been made out.

The paper is compactly and clearly written and well illustrated, and in every respect merits high rank in the literature of comparative sense-organs.

C. F. H.

II.—ASSOCIATION AND PERCEPTION.

Ueber das Grundprincip der Association; Inaugural Dissertation. By ARTHUR ALLIN, M. A., PH. D. (Mayer u. Müller, Berlin, 1895, pp. 84.)

The attempt is here made to assist in the reduction of the different laws of association to one, viz., the Law of Contiguity. The claims advanced by the supporters of the Law of Similarity are largely based upon what may be called the "Recognition Theory" of perception upheld by such a long succession of noted thinkers as Empedocles, Democritus, Kant, Herbart, J. S. Mill, Bain, Spencer, Sully, Wundt, Ward and Höfding. A refutation of this theory is therefore attempted. Paradoxically put, the theory asserts that all cognition is recognition, *kennen* is *wiedererkennen*, *connaître* is *reconnaître*. In every perception, the sense-impression of the object is said to call up by association through similarity a former image or memory picture of the same. These two are said to "fuse," "identify" and "recognize" each other, producing thus a "known" object. This process is held to take place in all perception, in fact in all cognition. Thus, this process of association by similarity is said to be the necessary presupposition of all association, including, of course, the Law of Contiguity. As Höfding has been of late the chief promulgator of this doctrine, he has been selected as chief exponent.

The following objections are urged against the theory. For their substantiation the reader may be referred to the article, "The Recognition Theory of Perception," in this number of the JOURNAL :

1. Perception is not, as stated, an act of memory.
2. Perception does not, as stated, involve comparison.
3. Perception does not involve the so-called process of "psychical chemistry."
4. In perception there is no "revival of former impressions."
5. The *Bekanntheitsqualität* ought, on Höfding's own grounds, to belong to the sense-impressions as much as to the "revived images."
6. The theory gives a false description and no proper explanation of abnormal perception, i. e., sense-illusion.

The Recognition Theory of Perception having been found to be utterly untenable, the Law of Similarity is forced to retire from the field of perception. The nature of perception is investigated and shown to involve, on the other hand, the Law of Contiguity, i. e., on the neurological side. On the psychical side an object is given as one (peripherally-excited) whole (*a b c d*). In ordinary perception we believe we perceive (as sensationally given) the whole (*a b c d*). On the neurological side it is shown that *a b* is peripherally excited, and that in all probability the nervous impulse underlying *a b* is propagated to the centres underlying the psychical *c d*. Psychically it is one whole; neurologically it is the process underlying association by contiguity. Abnormal perception or sense-illusion takes place when, on the neurological side, the nervous impulse involved in the *a b* is propagated along another associational path *ef*, thus forming on the psychical side the whole (*a b e f*). Thus the author reads the abbreviation "Abtg." as "Abtg." i. e., because one reads "Abtg." so often for *Abtheilung*, one is apt to read "Abtg." (*Ableitung*) also as "Abtg." Another example: In the evening twilight, on a lonely road, the traveler perceives a robber. Upon nearer investigation the external object is found to be the stump of a tree with gaunt, outstretched limb.

The explanation is the same. The true explanation of abnormal perception thus throws light on normal perception.

The Law of Similarity is also shown to be non-operative in recognition proper (*vide* the article "Recognition" in this number).

The prevalent teaching concerning "Assimilation" (Wundt, Bain, Mill, Dewey, *et. cet.*), is shown to be incorrect and contradictory to the facts in as far as it is said to involve the action of a law of similarity.

The different meanings and grades of similarity are taken up and shown to be unclear and confusing. The different cases of alleged association by similarity are shown to be analyzable into cases of association by contiguity.

The Law of Interest (Hamilton) is then examined in reference to and as an integral part of attention.

ARTHUR ALLIN.

Ueber den Einfluss von Gesichtsassociationen auf die Raumwahrnehmungen der Haut. VON MARGARET FLOY WASHBURN. Erweiterter Abdruck aus Wundt, *Philosoph. Studien*, XI Bd., 2 Heft. Leipzig, 1895, pp. 60. Doctor's Dissertation, Cornell University, 1894.

The important thesis which this paper supports is that the localization of tactual sensations in persons of normal powers of visualization is not immediate, but to a greater or less extent by means of visual associations. In other words, when asked to locate a point of the skin previously touched by the experimenter, the subject does so by means of a visual map of the part of the body in question. The fullness and accuracy of the visual map probably differ from man to man and for different bodily areas in the same man, areas which present strongly marked foldings of the skin (as at the joints) or the boundary lines of the members being represented with particular clearness and detail.

The first part of Miss Washburn's study is devoted to a careful survey of important literature from Weber (who seems once to have almost had this idea) through Czermak, Goltz, Volkmann, Vierordt's pupils, Fechner, Camerer and Goldscheider to Henri. In this the new conception justifies itself again and again by its power of explanation. It gives a reason "(a) for the greater distinctness of horizontal distances on the extremities as compared with vertical (Weber); (b) for Volkmann's observation of the rapid progress of practice and its bilateraleffect; (c) for Camerer's observation that the equivalence relation between two parts [as determined by his method] approaches nearer to unity than that established between the same parts by other methods; (d) possibly also for the results of Henri's experiments with localization on a photograph, which show that the localization error on the hand and wrist is smaller in the neighborhood of the folds and always occurs in the direction of the nearest folds." It also seems probable that visualization combined with anatomical conditions accounts for the greater sensitivity of the smaller parts of the body (according to Weber), or the more mobile parts (according to Vierordt), and for the superior discriminative powers of children observed by Czermak.

The second part of the paper contains the author's own experiments. These were made upon five subjects, two who were good visualizers, two whose powers were only moderate in this direction, and one, a woman of fifty, who had been blind since her fifth year, and who thus furnished an interesting counterpiece to the normal subjects. An apparently unavoidable difficulty in approaching the matter experimentally lies in the im-

possibility of getting on the same individual results both with and without the visual component. This is partly met by the experiments on the blind subject, but robs those on the other subjects of some of their directness. The results, however, are in general satisfactory. For details the reader is referred to the original. Volkmann's bilateral effect of practice was not found, possibly because the experiments on this point were not numerous enough and long enough continued. The bilateral effect was strongly marked in the experiments of Dresslar (this JOURNAL VI, pp. 325 ff.). Of incidental observations the following are interesting: the duality of the stimulus in Weber's circle experiments is easier to recognize than the relative direction of the points; the direction is better recognized when a straight edge of length equal to the separation of the points is substituted for them; the blind subject tended to underestimate the breadth of her arm as compared with its length—an effect possibly due to muscular associations.

The third part of the paper is given to a discussion of the psychology of the methods employed, and contains interesting observations on the effect of expectation and of the introduction of blank experiments (*Nullversuche*), i. e., tests whose object is to assure the operator of the state of the subject's attention.

That some such intervention of visual images as the author describes does take place in his own case, is clear to the introspection of the reviewer—certainly in cases where the grade of attention is high. The only wonder is that what seems so obvious and important should have been missed by the many distinguished investigators who have previously worked upon skin sensations. The author refrains from extending her principle of visualization beyond skin sensations, but it doubtless has a much wider scope. In experiments in the Clark laboratory made in the spring of 1895, and upon quite another topic, it incidentally appeared that visualization affected the subject's notion of his posture. The question naturally suggests itself whether there are not other vicarious functionings among the senses, and in general what the mutual relations of the senses are. Indeed, Miss Washburn's suggestion is so wide in possible development as almost to promise a new chapter in experimental psychology.

E. C. S.

Die Umwälzung der Wahrnehmungshypothesen durch die mechanische Methode. Nebst einem Beitrag über die Grenzen der physiologischen Psychologie. Von DR. HERMANN SCHWARZ. Leipzig, 1895, pp. xx-213.

This work consists of three treatises, related to each other only by the fact that they deal with theories of perception. The first—*"Das Problem des unmittelbaren Erkennens"*—traces the development of the general problem of perception from Democritus and Aristotle to Descartes and Hobbes. The second—*"Das Problem der Sinnesqualitäten"*—gives a discussion of the theories of the perception of sensory qualities in Hobbes and Descartes, as compared with the theories of the Greeks and scholastics. The third—*"Ueber die Grenzen der physiologischen Psychologie"*—is a critique of Exner's attempt to explain consciousness on purely physiological grounds. Although not logically connected, the arguments of the first two parts are so similar that we need not give them separate treatment here. Both alike trace the development of perception from the Greeks to Hobbes.

Dr. Schwarz divides epistemological theories into two groups: theories which make all perception perception at a distance (Aristotle), and theories of perception by direct contact (Democritus). The whole tendency of the development of the problem in medieval and modern philosophy is considered as an attempt to reduce perception at a distance to perception by contact. Much space is given to the attempts of Thomas, Suarez and Biels to get an intermediation between subject and object by means of the hypothetical "species." Stripped of their picturesque, mythical forms of expression, these accounts really mean that the qualities of the external object are in some way transferred to the mind, but that at the same time the object itself is known, and not merely its qualities. With Descartes and Hobbes mythical statement gives place to a mechanical construction. The whole process must be capable of clear statement, in terms of familiar mechanical processes. But the problem still is to obtain some means of intermediation between the object and the mind. And all the theories treated are alike, again, in the fact that they make the intermediaries themselves mere representatives of the external objects: we never know them, but only the objects through them.

The discussion of these theories is very clear, though often clear at the expense of brevity. Some pages are wasted by repetitions, in the second part, of matter already given in the first; but this is accounted for by the fact that the two treatises were written independently. Besides the development of the main argument, many minor problems incidental to the main theses of the various systems are examined with much acuteness, and many grave difficulties in the way of the unity of the several theories satisfactorily removed.

By far the most important of the three articles for the psychologist is the third, the discussion of the limits to the use of physiological processes in explaining psychological phenomena. Dr. Schwarz traces the development of the relation between physiology and psychology through three stages. In the first, the physiologist makes use of psychological elements in drawing his most general distinctions, of animate and inanimate object, and of plant and animal. The physiologist next frees himself from this dependence on psychology, and gives all his explanations in terms of bodily processes, without reference to mental. In the third stage, the present, the psychological is made dependent on the physiological. In this final form, physiological psychology seems to have no need of an introspective foundation. According to Exner, the lower centres determine the activity of the higher, and these in turn condition consciousness. There is no reverse effect, *i. e.*, consciousness has no effect upon the physiological processes. Furthermore, we cannot arrange a causal series of the psychical elements which shall be correlated with the causal series on the physiological side; since the more remote members of the physiological series, the activities of the lower centres, are entirely unconscious. It would appear, then, from Exner's theory, that introspection can give no aid in psychology.

If, however, this explanation is to suffice, it must stand two tests. First, can we readily state the ordinary psychical elements in physiological terms? And, conversely, can we apply the ordinary psychological terms to physiological processes? Exner's explanation, in terms of intensity and localisation of cerebral activity alone, seems to break down in both respects. When reduced to their lowest terms, Exner's sensations are three-dimensional entities; they have intensity, extensity and quality; while his physiological excitations have only two dimensions, intensity and place in the

cortex. This argument becomes still stronger if we add feeling to sensation as a peculiar process. And the difficulties appear yet more clearly when we try to translate our physiological processes into psychological terms. We must assume a conflux of cortical stimuli as the substrate for all complex mental processes. It must be supposed that we have only increase in intensity and extent of stimulation, as we pass from perception to idea and judgment. No sharp line can be drawn between them, in terms of their physiological substrate. No distinction can be made between the nervous excitation at the basis of analysable and unanalysable complexes. Both difficulties seem insoluble from the physiological standpoint.

This criticism would be unanswerable if we interpreted Exner's statements literally. But it is difficult to believe that he intends us to understand that there is no difference in quality (form) of nervous excitation, accompanying difference in the part of the cortex stimulated. If understood literally, Exner seems to have overreached himself in his desire to make his explanations as simple as possible. Moreover, aside from their references to Exner's theory, Dr. Schwarz' objections seem to have overlooked Stumpf's theory of a synergy of cerebral functions, as distinct from local association of functions. Nor would it complicate matters much if we assumed (as we surely have a right to assume) a difference of form, as between nervous excitations, and made this a third physiological attribute. We conclude, therefore, that the criticism of the article is not valid. There are possibilities enough in the variations of neural activity to explain all the facts of consciousness. It is only necessary that we should be willing to sacrifice simplicity to adequacy of explanation.

W. B. PILLSBURY.

Die Physiologie des Geruchs. Von Dr. H. ZWAARDEMAKER, Stabarzt-Dozent in Utrecht. Leipzig, 1895, pp. 324.

A comprehensive work on smell has long been desiderated, and here at last it is with twenty-eight cuts, a good index and register, and 232 titles on the morphology of olfactory organs among vertebrates, and done withal by a student of the subject whose previous brief communications on the subject justified high expectations. Although the author has devoted seven years to research in the field, he publishes reluctantly and upon the exhortation of Dr. Junker, his translator into German, in the hope that students "will devote themselves to this attractive field, which still promises rich harvests of surprising facts and hypotheses of wide bearings." The technique of the author's olfactometry and odorometry is most simple. A larger tube, containing the substance to be smelled, is slid up over a smaller calibrated tube, the end of which curves upward to the nostril, the whole being supported on a frame and worked as a syringe. The apparatus may be double, may work by pressure or by suction, and a branch tube to a Marey drum may be attached to mark time reactions. Each mark on the smaller tube measures one "olfact" of intensity, and in graphic fatigue tables olfacts are conveniently marked off on the ordinate and seconds on the abscissa. The author makes nine classes of purely olfactive odor materials. These he thinks of as located in the olfactory region, so that the energy zones corresponding to the nine classes are marked off by vertical lines, while within each zone is a scale designating the series of an homologous sequence of chemical combinations, these lines being curved to correspond to the curve of an inspiratory current of air. Each of the hypothecal quality

fields has its irradiation field. By his tables Dr. Zwaardemaker thinks all odors can be classified somewhat as, and about as well as, colors can be located on current color charts. An appendix follows on the chemical sense in lower animals, and another of clinical-neurological methods of measuring smell.

III.—MENTAL DISEASES AND ABNORMALITIES.

Mental Physiology, especially in its Relation to Mental Disorders. By THEO. B. HYSLOP, M. D. London, J. & A. Churchill, 1895, pp. 552.

This work, dedicated to Dr. George H. Savage, is described by its author as "elementary," and as attempting little more than "to bring together some of the more prominent phenomena of the brain and of the mind, both in their normal and morbid aspects." After a discussion of dualism and monism in the first chapter, and concluding that we need not settle the matter, the author passes to a view of the anatomy of the cortex and nerve cells and functions in the second chapter. Then chemical and nutritive functions, brain movements, general anatomy and localization bring him to the study of "mind." Unconscious cerebration, each sense, perception in general, sensory perversions and hypnotism are next discussed. Then, after an excursus on attention, conception, judgment, and imagination in their normal, he takes up their morbid forms. Memory, feeling and will are next treated in the same way, and the best, longest and most interesting chapters treat of the factors of insanity. Appendices on hypnotism and psycho-physics follow. In fine, we have no *physiological* data which give the faintest solution to the problem how the positive activities of the mind come to exhibit such endless diversities and infinitely varied relations.

Dr. Hyslop's book is unique in juxtaposing side by side and topic by topic with nearly equal space the elements of normal and morbid mental physiology. We have nothing quite like it. It seems, on the whole, better adapted to use in American college class rooms than any American text-book. It is less theoretical and speculative, and fuller of interesting and fruitful facts and cases. It is well up to date, moderate in compass, avoids subtleties and digressions, and is distorted by no pet theories. It is to-day what its prototype, Carpenter's "Mental Physiology," was in its day, with perhaps, however, relatively more normal psychology. We heartily recommend it to all American teachers and professors. The judicious use of the morbid side of soul life is well calculated to awaken interest, as this always does, but injurious possibilities are eliminated with very wise discretion.

La Confusion Mentale Primitive. Par DR. PH. CHASLIN. Paris, 1895, pp. 264.

The first eighty pages are historic, and part second is devoted to symptoms, psychology and physiology, etiology, diagnostic, prognostic, anatomy, place in scheme of classification and to treatment. At first the highest associations and the most abstract reasonings are affected, but phrases and ordinary acts are conserved, then constellations of images begin to loosen, centres break from their dependence. Words and phrases, *e. g.*, may be logical, but the sentences are incoherent, and at last words and even syllables lose their cohesion, and even the most elemental associations are affected, till the patient cannot orient himself in time and space and dissociation, and decomposition is extreme. Of course

the same process may occur in motor images, and acts may become incomplete and confused. It may be semi-dreams, transitory amentia, subacute neurasthenia, and may involve abated responsibility. There may be delirium, hallucination, agitation, inertia, emotional variations, or any of these may be absent. Of its pathology little is certain, but it is probably largely somatic, while its treatment is largely moral.

Contributions à l'Étude des États Cataleptiques dans Les Maladies Mentales. Par DR. PAUL LE MAITRE. Paris, 1895, pp. 96.

On the basis of fifteen cases and with an excellent summary of the literature (of which a comprehensive bibliography is appended), the author holds in substance: that cataleptic states which develop in the course of psychoses are often slight, brief and partial; that with increase of muscle tension and enfeeblement of voluntary psycho-motor activity they are often due to enfeeblement of perception of fatigue and to the persistence of communicated motor-images; they may develop in a number of mental maladies, especially in alcoholic delirium, melancholy, mental confusion, manias, periodic insanity, the delirium of degenerates, and in congenital or acquired mental feebleness; they may precede or follow an epileptic crisis; hysteria is rarely connected with them; there is no katatonia of Kahlbaum; and these states are easily simulated.

Les États intellectuels dans la Mélancolie. Par GEORGES DUMAS. Paris, 1895, pp. 142.

This modest little book is mainly a study of ideas among melancholics, and to base a determination of its forms on such a study. His main conclusions are three: I. That melancholy is not a mental entity, but is made up of phenomena of sensation and those of arrest. II. It may have an intellectual or an organic origin, but in both cases the motor precedes the sensory phenomena, and it is always only a consciousness of body-states. III. Synthesis is the law of ideas, images or mental states, which are associated with the conæsthesia, and this synthesis is logic.

The Melancholy of Stephen Allard. A private diary. Edited by GARNET SMITH. New York, 1895, pp. 305.

At the age of thirty Stephen Allard says he fled from Vanity Fair and took refuge among the hills to find consolation in nature, to rediscover his personality, regain unity, to read clear his heart, to find how to bear himself in this prosaic, mysterious world, to strive toward quietness, etc. He had learned to doubt, and felt sorrow, and had grown solitary while at Oxford, had felt himself well endowed with half-talents, but could not breathe in the arid heights of philosophy, and became a baffled thinker, a bankrupt idealist. As he had only latent faculties, and owned nothing the world cared to purchase, he tried to drug himself with literature. Education he had found only a rude struggle for prizes, a hoarding up of answers to questions that did not interest him, till he recognized unpalatableness as the criterion of truth, and science seemed a nightmare. Then he fell in love with Guérin, that victim of self-analysis and of morbid egotism; then Obermann, Musset, Schopenhauer, Lenau, Lucian, Hegel, but found no consolation. Then he tried action, but the actions of literary men; then love, but regarded women only as pictures, some more, some less fondly; and loved the beautiful, but even it was sad; so the thoughts of im-

mortality, stoicism and epicureanism were tried, till at last nature was found the best of all sinapisms.

Part II finds ennui the malady of the century, and his is the ennui not of feeling, but of thought. Both realism and idealists are products of melancholy, because of their abandonment of higher views. German philosophy, as a sort of pride in truth, has no cheer for the author, nor simple faith in letters. The purely autonomous sages are most serene, and the evolutionary Utopia is a tolerable halting place. Ecstasy, humanism, æsthetic and metaphysical religions, drama, music, mysticism were tried. Once he thought he found peace in self-renunciation, but the depression returned with almost suicidal intensity, and the book ends abruptly.

Allard we opine to be a lay figure, to whom the author ascribes his lucubrations. He must have been an omnivorous reader, but a superficial one, and the moral of this confession, if one can be psychologized from it, we suggest to be the unsatisfactory nature of voluminous but desultory reading. A mind that is like a well used sheet of blotting paper is a sad spectacle to others and must be unsatisfactory to its possessor. It is not a very remarkable work of genius.

The New England Invalid. The Shattuck Lecture for 1895. By ROBERT T. EDES, M. D. Boston, 1895, pp. 57.

The New England invalid, who "needs only to be built up," has a symptom for every organ, and no specialist can escape her. If the old physician gives her up, she bestows herself on the young. "The physician cannot dispose of her to the surgeon, for after her braces have given out, after her spine has been shortened by a vertebra or two, after her pelvis and her pocketbook are alike empty, she comes back." But it is the modern sisters and husbands who hear most of the functional irritations, distresses, the burnings, the flutterings, the quiverings, the throbbings, the tensions, the relaxations, the reproaches for indifference, the accusations of selfishness and the more trying repentance therefor, the ostentatious resignation of the misunderstood, the sympathy which they crave, the constant outflow of nervous force for which there is no adequate re-supply in a confident hope of recovery, who suffer and know most of her. The types described are: (1) the malingerers pure and simple, who feign disease out of whole cloth, with deliberate intent; (2) the exaggerators, honest but whimsical, silly and self-indulgent; (3) the constitutionally neurotic; (4) the hysterically excitable; (5) the neuromimetic; (6) the confirmed neuromimetic; (7 and 8) the tense and the limp neurasthenic; (9) the melancholic. While there may be something in the doctrine of the curative effect of surgical operations *per se*, removal of healthy ovaries rarely cures these cases. The lithæmic doctrine of uric acid, headache, or suppressed gout, does not show that there is not another neurasthenic headache. Some of these patients have a good blood color of even 80 per cent. Fleische, so anæmia is not always the cause. Next to those of no occupation, teachers and students supply most invalids of this type. The excessive New England conscientious school methods which make pupils "bite off more than they can chew," and especially examinations, are in part responsible. The author differs from Dr. Cowles' view that melancholy is a further development of neurasthenia, by holding the form to be a self-limited disease with beginning, middle and end, although sometimes becoming chronic. The figure which compares neurasthenia to a bank account constantly drawn on

without corresponding deposit, is exceedingly erroneous in "implying that no matter how low the account may go, it can be set right again at once by a single sufficient sum." If the patient has pride in the obscurity, difficulty or patience of her own case, as if saying to the doctor, 'I defy you to cure me,' then very pride must be turned in the direction of holding her recovery to be phenomenal, or her strength and elasticity great. We must learn many secrets of psychic treatment from charlatans.

Abnormal Women. A Sociological and Scientific Study of Young Women, etc. By ARTHUR MACDONALD. Washington, D. C., 1895, pp. 189.

The author studied philosophy and allied subjects in Europe for several years on a Harvard fellowship, and was later docent in anthropological psychology in Clark University, and for the last few years has been in the Bureau of Education in Washington. He has published books of considerable size: "Abnormal Man," "Criminology," and "Le Criminel-Type," and made many anthropometric measurements of children, and has traveled extensively in this country and Europe in quest of data for his investigations. Mr. McDonald appears to hold, with men like Kraft-Ebing and Lombroso, who have perhaps chiefly influenced him, that certain delicate themes are in crying need of investigation.

To find abnormal women in society the following advertisement was inserted in the personal column of a number of the principal newspapers in the large cities of our country: "Gentleman of high social and university positions desires correspondence (acquaintance not necessary) with young educated women of high social and financial position. No agents; no triflers. Must give detailed account of life; references required. Address Lock Box —." The book consists chiefly of letters and accounts of eighty-eight "cases" who replied to this advertisement, all names and most places being, of course, omitted. As the correspondents, mostly young women of refinement and education and undoubted respectability, "lived in all parts of our country, mostly in large cities, and some in Europe, the probability of any of them being identified is practically nil. It is difficult to see any serious reason why people in general should object to being studied, for the name of person or place is of no account." Some "gave their name and address in their first letter, illustrating the credulity of young women." The author's reply requested them to tell all about themselves. Those he was able to call upon were tested with delicate instruments of precision as to "acuteness of the nerves to heat, pain and locality." From these experiments the author inclines to the view that the cause of their disposition to answer "personals" was due, not so much to the nervous condition as to the fact that most are out of harmony with their present social environment. Most of these women have nothing special to do in life. The number that have traveled in Europe and speak more than one language is striking. These seem least able to focus, and soon tire of everything. Some answer at once; some think it over a week or more; some answer to escape monotony; some love mystery; some for curiosity; some to give the author a moral lecture. As a whole the letters are of exceeding interest and significance to the psychologist and sociologist. Some of them are brilliant literary products. It suggests wrong or defective education. The author's very brief pages at the close of the book are unsatisfactory, and do not, to our thinking, bring out at all adequately the lessons of these painful yet interesting pages.

G. S. H.

Doctor Judas. A Portrayal of the Opium Habit. By WILLIAM ROSSEY COBBE. Chicago, 1895, pp. 320.

This book is dedicated "to my wife, who, innocent, suffered most for my transgressions, and in grateful recollection of her gentleness, forbearance and love throughout the long night of opium slavery," and its motto is, "Opium is the Judas of drugs; it kisses and then betrays." The author writes his book from a pure sense of moral obligation, and has never given a thought to how it would be received. His habit was based on opium cordials given him as a child to quiet his cries by the advice of physicians, and, at the time of writing, he had been eighteen months freed from thralldom to the drug, after nine years of abject slavery. He inherited sensitive weakness, read sombre books as a child, resolved to enter the ministry, at seventeen was a skeptic, but later did chaplain duty in the navy. At the end of his slavery his body was pricked as by ten million needles, his knees smote in agony, every joint was racked with a consuming fire. The most truthful man will lie when in any stage of addiction to the opium habit, he says. Fears of death and suicide impulses were strong. Loquacity, abstraction of memory concerning the most common things, fits of personal excitement when everything seemed possible, spells of dreamy reverie, sounds in the ears, etc., were common. De Quincey is wrong in denying a tendency to increase the drug, that the drug's power declines with use, in ascribing the depression of spirits to "sedentariness" and not to the drug, and in saying that the drug added thirty-five years to his life, and that he decreased his daily dose. In all these respects Mr. Cobbe's experience is contrary to that of De Quincey, whose falsely attractive description of its effects has caused the opium habit in thousands of cases among the best classes. Much, he says, is in short an opium lie. The stages are: cessation of pain, voices clearly uttering distinct sentences, double and distorted vision. Laudnum phantasmagoria, insomnia, semi-cerebration, horrified and fantastic night dreams, visions of battles and judgment in a crescendo series are described. Just what the good angel in human form was that cured him, we are left in doubt. On the whole the book adds little to either the medical or literary contributions. The language is superlative, the book is rather incoherent and tedious, and whether the work of a genuine victim of the habit or not is likely to be most useful as an appeal to other victims. Even these, however, will chiefly miss the practical details of the cure and its causes.

Bill Pratt, the Saw-buck Philosopher. By I. S. ZELIE and C. PEREZ. Williamstown, 1895, pp. 121.

This strange character, familiar to the students of Williams College for fifty years, was a man of stalwart frame, rather feeble witted, but with a passion for oratory and a sense of oratorical rhythm that were of remarkable psychological interest. His good nature was boundless. For any student he liked, or for any small group, he would stop sawing wood and pour forth a volume of impassioned oratory, which, despite its incoherence, his great physique, and voice, and vigorous action, made impressive, and which would impress any one just far enough away not to hear the words, as the intonations and cadences of a consummate rhetorical climax. His flights were always brief, and generally ended in a sudden drop to bathos, which seemed to gradually develop as his defense against the derisive element in the uproarious applause which followed. One or two illustrations must suffice. The follow-

ing is an impromptu funeral address delivered one day and stenographed in front of West College, just after a funeral procession had passed: "Murmur and mourn! The language of life is past. The grass of gullery is gone, and the electricity of the bay-rum tree is decided with the laments of refuge. Oh, he was a good man. How the grasshoppers of his belief floundered with the winds of his whiffle-trees. What a burden he was! What a beautiful Pharisee! By the corduroy of his attainments and the melody of his magnificence he retired, and the palms of his pussy-willows wave with the rolling Ottaw." To a theological graduate on his return to the college, whom he met on the street, he orated thus: "You have the gloomy shines. Worn with a tumult of the conflict of Hebrew and a scrutiny of salvation, are you consumed with your mountainous circumstances? Are you deprived? No, sir! Why, sir? Because you have regulated your eccentricities, and you now have a coherent ideification." Of the clergy, he said: "They are men of deprudence. They have walked the verges of life with a crucifixion of memory. They have hibernated among the sanctified symptoms and a confession of matrimony. Oh, the catechism of chief end of man. How they have walked the verges of life with the carbolic acid of depression," etc. Sometimes in these flights his eyes were closed and he seemed as if mentally belaboring his theme with intense abandon. If there is such a thing as an innate vein of genius for oratorical rhythm, a pure declamatory instinct, it was found in Bill Pratt. Perhaps, in a more favorable age, he might have been a rhapsodist like Plato's Ion, or a muttering oracular dervish, into whose incoherence it is so easy to read higher meanings. Perhaps, as it was, his perfervid improvisation might have weighed a trifle as a warning object lesson against the spouting diathesis which some teachers of rhetoric in colleges other than Williams sometimes foster. It seems, at any rate, a most interesting psychic background or foundation on which no adequate superstructure was reared.

Die drohende physische Entartung des Culturvolkes. Von W. SCHALLMAYER. 2 Auflage. Berlin, 1895, pp. 49.

Modern individualistic tendencies are at the cost of the race, and the only cure is the application of human reason to the problem of natural selection. Great cities, bad school methods which hurt the nerves, factory life, fashion, the extremes of both poverty and riches, etc., interfere with natural selection. Against all the tendencies to progressive degeneration of soul and body, the author proposes that all physicians should be made state officers, and that detailed "family books," should be kept recording all medical and hygienic facts concerning each member of the family, by a plan to be kept for centuries. Thus future generations can draw certain conclusions concerning the heredity of neuroses, early and late marriages, etc.

IV.—FEELING AND TEMPERAMENT.

Studies in the Evolutionary Psychology of Feeling. By HIRAM M. STANLEY. London and New York, 1895, pp. 392.

"This work," the author tells us, "does not profess to be a treatise on the subject of feeling, but merely a series of studies, and rather tentative ones at that. I have attempted to deduce from the standpoint of biological evolution the origin and development of feeling, and then to consider how far introspection confirms the results." Some of the material of the book has appeared

within ten years in various journals, but all has been revised or re-written. The author assumes that frank emotionalism is necessary in the struggle of life; that intellect must always be impelled by emotion, either personal or impersonal, like duty or love of truth. Feeling is the basis and core of mind, actuating both will and cognition; cannot be destroyed, but must grow ever stronger, deeper, nobler. Mind begins in pure pain, and culminates in the higher emotions. Its expression crystallizes into language, and even causes the rise of objectification. The number of names of feeling is but a very rough index of the number of kinds of feeling, for which the psychic chemistry of the future will develop names. The unnamed forms far exceed the named, and the number of indiscriminated or undiscovered feelings far exceeds both. Consciousness is indefinitely complex, and the system-making psychology is factitious and delusive. The number of unknown psychoses is, perhaps, almost infinite. Science, art, ethics and religion are at bottom only phases of emotionalism. Other as valid and essential expressions are yet to be developed. The activities of new born animals seem spontaneous only because they are the results of energies stored in ages of psychic effort. The effort to see has produced the optic nerve. The confusing of objective and subjective terms, of inspection and introspection is responsible for much of the present confusion. The limitations of the author's introspective method are fully realized, and there is a despairing note in the last chapter concerning future progress.

The best chapters are those on fear and anger. The former is a primitive emotion, and is pervaded by anticipation of the primitive feeling of pain, but the pain in fear is not wholly revival. If intense, it tends to vanish in the sensation feared. When it declines, it repeats the stages of its growth, but inversely. Fear is "a feeling of reaction from the representation of the feeling potency of the object." "Only introspective analysis can reveal the true motive and genesis of fear and all emotion." But here, as so often in this book, the reader is brought up with the idea that will obtrude, that if introspection is the method, and this is all it can do, we may well despair. How, too, does he feel sure that his series, fright, alarm, terror, dread, horror, is the "chronological order." Anger is the stimulant to offensive reaction as fear is to defensive. It implies a "sense of object," it has an element of "hostility."

On the whole the author deserves praise for admitting the biologic factor in feelings—but his recognition of its scope seems sadly inadequate. His method paralyzes him in this field as in no other. Psychology finds the emotional realm so hard to enter, only because of the amphibious dualism pervading the text-books of the past decade. In some minds this has become a positive neurosis. It obtrudes its double housekeeping upon minds natively sound and ingenious and may cause an ebullition of brilliant ratiocination, like salt on flames. It often repels from philosophy or sterilizes the very central buds of mental and moral growth, and clips the wings of minds, which, like this author, by nature and by interest in the subject, seem fitted to enter these fields. We took up this book with great expectation, but lay it down, not without being much instructed and stimulated, but with a predominant sense of disappointment.

G. S. H.

Tempérament et Caractère selon les Individus, les Sexes, et les Races.
Par ALFRED FOUILLÉE. Paris, 1895, pp. 378. In Felix Alcan's
Bib. de Philos. Contem.

This gifted and facile author enters here a field of great interest,

to which he makes contributions of high value. The sensitive temperament is sub-divided into that with prompt and that with intense reactions, and so later is the active temperament. Actives, who are prompt and intense, are not unlike the old choleric, and those slow and feeble are like the old phlegmatics. Characters are classified as *les sensitifs, les intellectuels, les volontaires*. The last and larger half of the book discusses difference of temperament, character, of sex, and of different races of man, with a final glimpse at the future of superior races. Recent biological studies show a very intimate union between character and temperament. The reactions of will, which is increasingly intelligent, upon our inner constitution are what evolves character. These studies are not made on the hypothesis that character is immutable and that therefore morals are useless save for weak characters. The author discusses whether character is reducible to molecular mechanics, or a neural tone, as Henle says; whether feeling and action strengthen or weaken each other; whether the disposition of nervous people to melancholy is due to too little voluntary movement compared with sensations, etc. He defines the sanguine temperament as marked by integration predominant, by excess of nutrition, with quick but feeble and brief reaction; the nervous is sensitive and passionate, with lack of nutrition, with slow but intense and long reaction; the bilious is marked by rapid and intense disintegration, and the phlegmatic is marked by slow and feeble disintegration. Schools might gain by grouping these temperaments by themselves and applying to each its special methods. Whether there were originally an indefinite number of human races, man does tend to maximize in all his conduct. Thus in history, the good are often the feeble, who have not force enough to be bad. It is more likely that the leading races will overcome the others than that they will mix or develop side by side. Once the race type was all and the individual nothing, then individuality had its maximization. The future will be able to harmonize these two tendencies, if we do not relax effort and trust blindly to our *fin de siècle* deity of progress. The only way to arrest impending degeneration in the highest races is by a vigorous use of intelligent will, and recognizing that science will not make men moral, that culture of art only changes the form of vice, to strive toward a veritable education of character, which is the education of the future.

L'Amitié Antique d'après les Mœurs Populaire et les Theories des Philosophes. Par L. DUGAS. Paris, 1894, F. Alcam, pp. 454.

This is a very interesting, useful and timely book. It appears to be a dissertation, and attempts to give the history of friendship in both theory and fact from the days of its conception as a physical force by Empedocles and Herodotus down to the end of the stoic age among the Romans, with copious and judicious citations, analytical tables prefixed to each chapter, with a digest of the whole, and the literature by chapters at the end. The fact that it is written by a doctor of letters rather than by a philosopher, is perhaps a good thing at a time when the treatment of this theme in current text-books on ethics is so hackneyed and arid, and when the psychology of feelings and sentiments seems coming to the fore. The author seems almost to assume with Taine that history is nothing but the history of the heart, and historic research has done its work when it has given us a picture of the dominant sentiment of an age. Friendship also is, of course, very distinct from love of sexes, love of God and philanthropy, and is one of the chief virtues.

Plato and the stoics were right. Only the good have real capacity for friendship. From the Pythagorean, at least, down through the academy, porch and grove, it was developed among most philosophic schools, except the sophists. So Aristotle's *amicus Plato, sed magis amica veritas* was bold as it was historically important. In the relations between teacher and pupil, friendship has one of its chief, if not its chief, and most desiderated fields. It must be absolutely pure, free and spontaneous. The duty element alloys it. It is a token of moral distinction—the passion of noble and delicate souls; as it loses in extent, it gains in quality, and vice versa. To-day social and political and other interests have almost extinguished it. Especially since the day of romantic love of women, and since modern education has made them the companions of men, friendship in the classical sense is little developed or employed, but it still preserves its moral charm, and is cherished by great, delicate and generous souls. It is still for many the core of their moral life. While it is no longer a cosmic force as in early philosophic systems, and no longer fills a place as large as did love in the ages of the early Christians and chivalry, it is on the verge of a renovation; both in ethics and in modern life.

V.—PHILOSOPHICAL.

Eros und Erkenntnis bei Plato, in ihrer gegenseitigen Förderung und Ergänzung. Von CARL BOETTCHER. Berlin, 1894. Wis. Beiträge für Jahresbericht des Luisenstädtischen Gymnasiums.

Neither M. Koch nor H. Hille has really shaken the Schleiermacher-Zeller idea of Eros as identical with the philosophic impulse. Plato himself probably lived out this idea, but the Eros is also clearly connected with the theory of knowledge. From a study of this doctrine in the *Lysis*, *Phædrus* and the *Symposium*, the author concludes that both Eros and knowledge point to pre-existence and immortality. One seeks the beautiful-good, and the other true existence. These are the same, but the good is supreme and so love is highest. Knowledge is reminiscence, and is determined by the degree of perfection which Eros attains, for the latter is but the impulse to the pre-existent, to get back or return, as some etymologists of religion suggest. It is the bottom lust toward perfection.

Wesen und Entstehung des Gewissens, eine Psychologie der Ethik. Von DR. TH. EISENHÄUS. Leipzig, 1894, pp. 334.

This essay obtained the first prize offered by the theological faculty in Tübingen for the best treatment of the question whether the basal element of ethics is *a priori* or empirical, but it has since been greatly expanded and rewritten and radically changed. The first 160 pages are historical. The last part traces conscience up from biological bases, through organism and animal instinct, and the crude custom of primitive man. But the highest ideal of a completely evolved conscience is found in the Christian ideas of God's kingdom.

Die Psychologie des Unsterblichkeitsglaubens und der Unsterblichkeitsleugnung. Von G. RUNZE. Berlin, 1894, pp. 244.

The author, a Berlin professor, in his series of studies of comparative religious sciences, publishes this volume, which is to be followed by a second part on Immortality and Resurrection, as the first in his series. The idea of immortality originates partly in animism, partly in wish, in dream, in the difficulty of conceiv-

ing death, in the sense of retribution, and is one with the God-idea. Its negation by Mosaism, Buddhism, and Confucianism is discussed. For the general conclusions we are referred to the forthcoming volume. Great stress is laid on the worth of childhood for normal religious psychology and upon the principal *quod volumus credimus*, as even the gods are creatures of our wishes. The feeling that no trace of our earthly life can vanish in all the aeons is neither pious nor true. It is not more the *horror nihili* than the impossibility of conceiving annihilation that constitutes the strong negative motive. Psychological considerations warrant no inference concerning the truth or error of an idea so profoundly and irresistibly motivated. This and more underlies all myth, dogma and revelation touching post-mortem existence.

Einführung in die Philosophie. Von OSWALD KÜLPE, Professor an der Universität, Würzburg. Leipzig, 1895, pp. 276.

Called from Wundt's laboratory to the chair of philosophy, it is natural that Dr. Külpe should interest himself with the introduction to philosophy, and he states that this little volume arose from didactic needs and experiences. The author proposes a "complete orientation concerning the bearing and essence of philosophy," and would describe the "various independent tendencies and achievements in the past and present" with unprejudiced and equal interest, with an evaluation of their value, despite the unavoidable subjectivity and limitations of knowledge. As general disciplines he treats metaphysics, theory of knowledge and logic, and as special disciplines he takes up the philosophy of nature, psychology, ethics and the philosophy of right, aesthetics and philosophy of religion and of history. The tendencies he discusses are singularism and pluralism, materialism, spiritualism, dualism, monism, mechanism, teleology, determinism, and the theological and psychological tendencies in metaphysics. The epistemological directions are rationalism, empiricism, criticism, dogmatism, skepticism, positivism, idealism, realism, and phenomenalism. The ethical sections are headed: views on the origin of morals, the morals of feeling and reflection, individualism and universalism, subjectivism and objectivism. The final sections are on the problem and system of philosophy.

Those who have heard Wundt's lectures upon the above philosophical tendencies or read his works will find little that is novel in this book. The revival of the old German idea of a propaedeutic or encyclopaedia of philosophy was a happy thought, and raises very interesting problems touching the progress of philosophy. Its first suggestion, even in the index, is that in America our professors are in danger of losing the sense of proportion among these disciplines in their teaching. If this is the best introduction, then the methods of inducting the novice through Locke, Berkeley and Hume or ethics, or elemental logic, ethics or psychology, are wrong. If the object of such an introduction is to develop a bird's-eye knowledge of vast intellectual fields, Dr. Külpe is right, but from his standpoint philosophy is in so far an information study, and its culture power is not much evoked. On the whole one inclines to the view that such preliminary triangulation of vast mental spaces would prove dreary to American students, and that it is too abstract if not too superficial. Possibly a ripper scholar in the field, with larger experience in teaching, might bring out greater culture power than Dr. Külpe has done with all his hardihood in attempting an "ology" of all the philosophical isms.

G. S. H.

Friedrich Eduard Beneke, the man and his philosophy. An introductory study. By FRANCIS BURKE BRANDT, PH. D. New York, 1895, pp. 167.

This is an interesting, convenient and careful work, and is No. 4 of the "Columbia College Contributions" to philosophy, psychology and education. The first thirty-seven pages are devoted to Beneke's life and character and the rest to his doctrines, with a final critical estimate, influence and followers. The whole is clearly told, and we are indebted to it for a better view of the system than we have ever had before in English.

VI.—MISCELLANEOUS.

The Psychology of Number and its Applications to Methods of Teaching Arithmetic. By JAMES A. MCLELLLEN, Principal of the Ontario School of Pedagogy, Toronto, and JOHN DEWEY, PH. D., Head Professor of Philosophy in the University of Chicago. International Education Series. New York, 1895, pp. 309.

We can think of few subjects in the entire field of psychology that are riper for comprehensive treatment, or the applications of which are more needed in pedagogy, than the psychology of number. Many studies have been made in laboratories on the perception of dots, lines, figures, in the direct and indirect field; many more on counting and the various rhythms involved, the "psychic constant" and its compounds, the psychology of born calculators has been worked out, and the number-systems of primitive people and children's idea of numbers. Other studies are made on number forms, on fatigue in simple operation on numbers, etc. Thus, when we first saw the announcement of this book by an author so capable of gathering up and coördinating these and other lines of work, with the historic material, hardly less interesting, we looked forward with great interest to this book. Dire, however, has been our disappointment. Not one of all these topics is treated with any serious effort at thoroughness, if, indeed, any of them are mentioned. Again, there are many methods of teaching elementary arithmetic, both current and historical, and these should also have been at least mastered by the pedagogic author with a thoroughness of which these pages give no trace. We would suggest for a title of this work, "A Method of Teaching Arithmetic, Explained and Justified, and Preceded by some Philosophic Considerations." We must sympathize with a teacher who, in commenting on it, said in substance that "if the new psychology had nothing better to offer than this, its barrenness will be a great disappointment to hosts of teachers." The first chapter is entitled, "What psychology can do for the teachers," and is surely needed. Number, it is urged, is, first of all, a rational process and not a sense fact. This cuts up all experimental roots at the start, is at best only a partial truth in the author's sense, and is radically and profoundly not only unpedagogic, but anti-pedagogic. The first *educational summary* is: "The idea of number is not impressed upon the mind by objects, even when these are presented under the most favorable circumstances." Thus nearly every object lesson in arithmetic since Comenius is wrong. The origin of number is derived from the Hegelian ideas of limit. The psychology of quantity is "summed up" in these italicized words: "That which fixes the magnitude or quantity which, in any given case, needs to be measured, is some activity or movement internally continuous, but externally limited. That which increases this whole is some union or partial activity into which the original continuous activity may be broken up (analysis) and which, repeated

a certain number of times, gives the same result (synthesis) as the original continuous activity." The next important summing up is: "(1) The limitation of an energy (or quality) transforms it into quantity, giving it a certain undefined muchness or magnitude, as illustrated by size, bulk, weight, etc.; (2) this indefinite whole of quantity is transformed into definite numerical value through the process of measurement; (3) this measuring takes place through the unit of magnitude by putting them together till they make up an equivalent value," etc., etc. This high cothurnus method of stating with such formal top-loftiness simple and obvious truths till their very inflation makes them seem thin and unreal, does not seem to the writer good metaphysics even, and still less good psychology. G. S. H.

Psychology for Teachers. By C. LLOYD MORGAN, Principal of University College, Bristol. London, 1895, pp. 246.

This book, which is heartily commended in a preface by I. G. Fitch, late inspector of training colleges, first describes states of consciousness, and defines psychology as treating of them. Association, experience, perception, analysis, generalization, description and explanation, mental development, language and thought, literature, character and conduct follow in this order. The book is very simple and elementary, well sprinkled with poetic passages, and with a wholesome ethical application in the last chapter. The question repeatedly recurs whether it is not a little too elementary for teachers, to whom it is addressed, but for its class, it is certainly the best we have in English. Most of its many innovations in subject matter and manner impress us favorably.

Outlines of Psychology, Based upon the Results of Experimental Investigation. By OSWALD KÜLPE, Professor of philosophy in the University of Würzburg; translated from the German by EDWARD BRADFORD TITCHENER, Sage Professor of Psychology in the Cornell University. London, Swan, Sonnenschein & Co.; New York, Macmillan & Co., 1895, pp. 462.

As the JOURNAL has already reviewed the German edition of this treatise, we desire here merely to call attention to this excellent translation. That it is the best treatise in English on *experimental* psychology goes without saying. The translation has rendered to American and English teachers and students of the subject a service that the writer believes they will not be slow to appreciate.

Die Spiele der Thiere. Von KARL GROOS. A. V. Prof. der Philos. in Giesen. Jena, 1896, pp. 359.

The author assumes that animal psychology should have an independent position, and not be regarded as of interest only as it sheds light on the psychology of man, and points of resemblance to man should not receive disproportionate attention. If conversely, we regard what is specifically animal in animals, we shall arrive at a better idea of the animal traits in man. Only a student of aesthetics can properly treat the psychology of play. This is the author's specialty and also his standpoint. Professor Groos rejects the current view of Schiller and Spencer that play is a discharge of superfluous energy; indeed this is not a *conditio sine qua non* of play. The problem centres in the explanation of the play of young animals. Certain instincts, essential for the preservation of the species, appear before they are needed. These pre-functional instincts require practice, and fall under the laws of natural selection. Since these inherited instincts can be improved by individual

practice, selections can weaken the blind power of instinct and favor the development of intelligence as a substitute for it. When intelligence becomes strong enough to be more useful than perfect instincts, selection will favor individuals in whom imperfect instincts can be developed by practice during youth, i. e., those that play. Indeed, in a sense, youth is for the sake of play, and animals are young because they must play, and not vice versa. The instinctive underly of the females causes wooing and obstructs the discharge of the sex passion and sublimates it. "Experimenting" plays are primeval, and rest on the pleasure of being a cause. Conscious self-deception is another permanent factor. All animal plays and probably also all human plays, on which another volume is promised, fall under one of the three experimenting, joy or power to do or conscious self-deception, viz., (a) self-presentation, which is personal, and involves animal wooing, and in man the arts of dancing, music and poetry; (b) imitation, which seeks the true and is seen in mimetic arts, sculpture, painting, epic and drama; and (c) ornamentation, which strives for beauty in self-decoration, in architecture, etc.

The book is full of interesting and well sifted and classified facts, but the scheme of classification which is evolved is sure to strike many readers as too artificial to be nothing if not "biological," as the author strives to be. It is of great suggestiveness, and is the first book known to us upon the subject.

The Psychic Development of Young Animals and its Physical Correlation. By WESLEY MILLS, M. A., M. D., F. R. S. O., Prof. of Physiol., McGill University, Montreal. Reprint from the transactions of the Royal Soc. Canada.

The author has for years been studying the psychic and physical development or several animal groups, with a view to compare groups and individuals, and also to connect the physical and psychical growth. This paper is part of this plan, and is a series of careful and almost daily notes on the development of a litter of pure-bred St. Bernard puppies, whelped in the spring of 1894, for the first two months of their lives. These records are full of interesting points, but not adapted for summary or digest.

A Manual for the Study of Insects. By JOHN HENRY COMSTOCK and ANNA BOTSFORD COMSTOCK. Ithaca, N. Y., Comstock Publishing Co., 1895, pp. 701. Net, \$3.75.

The senior author is professor of entomology in Cornell and in the Stanford University, and the junior author has engraved most of the 797 wood cuts herself. The work is designed to meet the need for an elementary, systematic text-book for the use of students in high schools and colleges, and of teachers in primary and secondary schools. Perhaps the most distinctive feature is a series of analytical keys, by means of which the family to which any North American insect belongs can be determined. Under the head of each family the characteristics of the family, both as regards structure and habits, are given, and the more common species described. It is thus possible for the student to classify any insect to its family, and to learn the habits of the insects of that family, and, in the case of the more common species, to learn the name of the insect. The book seems to be a work of love, and is by far the best in English, and should be in the hands of every psychologist and every teacher of whatever grade interested in entomology.

NOTES

We regret that in the editorial in the last number of the JOURNAL the name of Toronto was included in the list of laboratories whose directors had been at some time connected with Johns Hopkins or with Clark University. It was an error which we are glad to rectify here. Those interested in certain other criticisms of that editorial and in the reply to them are referred to *Science*, Nov. 8 and 29.

On page 139 of the last number of the JOURNAL, a person who preferred the spiritual to the true and natural explanation of a form of alate writing trick was spoken of as a "member" of the English Society for Psychical Research. He should have been called an "associate." Thus his name appears in the list at the end of the Proceedings xxvi, Vol. X, Aug., 1894. Mr. F. W. A. Myers desires us to say that his communications have been as an informant and not as a correspondent. Our words were: "prints communications in the English Proceedings," etc.

By inadvertence the initials of the reviewer, G. S. H., were omitted from the notice of "Thinking, Feeling, Doing," by Dr. E. W. Scripture, page 146 of the last number.

NEWS.

The *Gesellschaft für psychologische Forschung* is preparing a volume of short studies as a *Festgruss* to the International Congress of Psychology in Munich.

A psychophysical laboratory has been established in Moscow, under the direction of Professor Tokarski. Twenty students are taking work this year.

With 1896 begins the issue of a new Russian *Journal of Psychiatry, Neuropathology and Experimental Psychology*, edited by Professor Bechterew. It will appear monthly, in parts of five or six signatures.

Dr. Schumann has habilitated as *Privatdozent* at Berlin.

Professor Wundt has published the new edition of his *Logik*, and is now engaged upon anthropological material.

Professor Ribot is not lecturing at the College of France this year. A course in experimental psychology is given by M. Pierre Janet.

Dr. F. Hillebrand, well known by his work in psychological optics, has been appointed extraordinary professor of experimental psychology at Vienna.

The Cornell Laboratory has moved to new quarters, and now occupies a space of 140x45 feet,—a series of nine rooms. A full description will be published elsewhere.

OUR EARLIEST MEMORIES.

M. Victor Henri asks us to publish the following list of questions. We possess very few observations on our earliest recollections. I should like to make a series of observations in this subject. I shall be grateful to all persons who will send answers to any or all of the following questions:

1. What is the earliest recollection of your childhood? Please describe it as fully as possible.

1. Age and usual occupation.
2. Do you have good *visual* representations of objects in general; viz., can you form a visual image of an apple or of a lamp, etc.?
3. Do you have good *auditory* representations (of sounds), viz., have you auditory representations of the voices of your friends?
4. What is the earliest recollection of your childhood? Please describe it as fully as possible. How clear is it, and what was your age when the fact recollected occurred?
5. Had this fact a particular importance in your life, and if so, in what way?
6. Has any one ever related this fact to you, or do you remember it yourself?
7. Can you give any explanation of this recollection, and if so, what?
8. What is the second recollection of your childhood? How far apart are these two in time?
9. Of what period of your life do you first have many recollections without connecting them in the time series of your life? How do they appear; are they clear, are they visual or auditory, etc.?
10. From what period of your life do you begin to have recollections of the time series of your life?
11. Do you ever have recollections of your childhood in your dreams? If so, what?

Please send the answers to these questions to Victor Henri, Leipzig (Germany), Johannis Allée 12. II."

SOME CONSTANT SOURCES OF ERROR IN "RECOLLECTION."

In attempting to answer the above questions, one must pay especial attention to three rules of introspection of memorial contents. (1) Care must be taken that the occurrence remembered is not a *dream* memory. Sometimes a dream memory bears upon its face the marks of its origin; thus one of the writer's earliest and most distinct "memories" is that of flying down a flight of stairs, from nursery to dining-room. Most children play at a "flying game," which consists in standing on a chair and flapping the arms bird-fashion. In the present instance, a vivid dream following upon the playing of the game has persisted as a true "memory." The conviction of the reality of the experience is absolute in the writer's mind; it is logic, and not psychology, which tells him that it could never have happened.—Now, at other times, the logical criterion is difficult or impossible of application; and the memory record has, therefore, very little value, unless corroborated by external evidence. (2) Care must be taken that the memory is the memory of an *experience which was never reduplicated*. Another of the writer's early memories is that of a mantel-shelf, on which stood three vases—two green and white, and one reddish purple. Why the particular set of visual images made so strong an impression on consciousness, he does not know. But here is the point: The memories of mantel-board and purple vase are extremely hazy. These objects ceased to be seen at a very early period of his life. The green and white vases are distinctly remembered; but they were seen, off and on, until about his fifteenth year. Now, how much of the total memory is original, a true child memory; and how much is due to the recurrent suggestions made by the green and white vases? (3) Care must be taken that the memory be a *real memory*, in terms of mental images of the experience, and not a "memory about," that is, a memory evoked by the form of words used to describe that experience. A friend of the writer's remem-

bers accurately a funeral which took place two years before he was born. The description made a deep impression on his childish mind; and he has subsequently reconstructed the experience from the form of words employed to describe it. Here again, there is need of external evidence and control.

THE MUELLER-LYER ILLUSION.

The typical form of this illusion is the following: Two straight lines are drawn, of equal length. The one is bounded by oblique lines which make of it a double-headed arrow, the other by oblique lines which make of it an arrow-shaft, feathered at each end. The latter now looks considerably longer than the former.

An interesting practical illustration of the illusion is given in two recent books upon freehand lettering (H. S. Jacoby, "A Text-book on Plain Lettering;" F. T. Daniels, "A Text-book of Freehand Lettering.") It follows from the illusion, as described above, that the round-topped letters (O, C, S, etc.) will seem shorter than the square-topped (T, E, etc.), if the two sets are objectively of the same height. In looking through some books of printer's alphabets, the writer has found that this fact is not seldom allowed for: a lineal, laid over the alphabet squarely with the tops of the square letters, lets the tops of the round letters appear above it. But as many alphabets make no allowance for the illusion, it would seem that the rule of difference is not explicitly recognised by type-cutters.

Mr. Daniels calls attention to the psychological factors in the illusion (p. 10), and illustrates them very forcibly in Plate 3. Professor Jacoby also enters into the reasons which make it necessary to increase the height of the curved letters (pp. 4, 8, etc.), and illustrates in several plates.

THOUGHT TRANSFERENCE.

The judgment passed upon the methods of the "psychical research" societies, in the previous number of the JOURNAL, is fully borne out by experiments upon thought transference, published by Drs. Hansen and Lehmann in the current number of Wundt's *Philosophische Studien*. The authors set to work in grim scientific earnest, with an arrangement of concave mirrors, to discover whether transference of visual thought pictures was effected by any new mode of energy, "radiation," or what not. It was found that they were not transferred at all. What happened was that the transmitter involuntarily whispered the name of the impression to be transmitted, and that the percipient heard the whisper. An elaborate study is made of the carrying power of the whisper, of its phonetics under different conditions of production, of the confusions to which it is liable—as distinct from the confusions possible with spoken words, of its voluntary suppression, etc.; and the results of Professor Sidgwick's "experiments" are subjected to a searching analysis in the light of the new source of error.

The investigation is a model of methodical work,—of work carried on in the spirit of impartial scepticism, which is characteristic of the scientific method in general.

ERRATA IN THE TRANSLATION OF KUELPE'S PSYCHOLOGY.

By the courtesy of my fellow editors I am enabled to give here what I believe to be a complete list of the *errata* in my translation of Professor Kuelpe's *Grundriss der Psychologie*. I have apologised

to purchasers of the work as best I could, by having a slip printed in which attention is called to the principal errors. The printing of the translation overseas made it impossible for me to undertake more than a single revision.

Page	4 line	38	for differences,	read	differences
"	17	"	"	"	"
"	35	"	"	"	"
"	44	"	"	"	"
"	61	"	"	"	"
"	70	"	"	"	"
"	73	"	"	"	"
"	105	"	"	"	"
"	108	"	"	"	"
"	136	"	"	"	"
"	166	"	"	"	"
"	190	"	"	"	"
"	197	"	"	"	"
"	207	"	"	"	"
"	208	"	"	"	"
"	233	"	"	"	"
"	242	"	"	"	"
"	250	"	"	"	"
"	268	"	"	"	"
"	276	"	"	"	"
"	278	"	"	"	"
"	280	"	"	"	"
"	294	"	"	"	"
"	295	"	"	"	"
"	297	"	"	"	"
"	297	"	"	"	"
"	311	"	"	"	"
"	311	"	"	"	"
"	317	"	"	"	"
"	322	"	"	"	"
"	325	"	"	"	"
"	343	"	"	"	"
"	375	"	"	"	"
"	387	"	"	"	"
"	387	"	"	"	"
"	421	"	"	"	"
"	462	"	"	"	"
"	462	"	"	"	"

MEETING OF THE PSYCHOLOGICAL ASSOCIATION.

The fourth annual meeting of the American Psychological Association was held at the University of Pennsylvania on Dec. 27 and 28, the time and place having been chosen to coincide with the meetings of several other more or less closely related societies, to wit: the Geological Society, the Physiological Society, the Association of Anatomists, the Society of Naturalists and the Morphologi-

cal Society. The opportunity thus afforded of meeting and hearing distinguished workers in other lines added much to the interest of the psychological programme. It is needless to add that the visitors were most hospitably entertained by the Local Committee of Reception.

The programme was as follows: Friday morning: Psychology and Physiology, Professor George S. Fullerton; Description of a Series of Physical and Mental Tests on the Students of Columbia College, Dr. Livingston Farrand; Some Psycho-Neural Data, Dr. Arthur MacDonald; An Experimental Investigation of the Processes of Ideation, Mr. Oliver Cornman (introduced by Professor Lightner Witmer). Friday afternoon: Address of the President, Professor J. McKeen Cattell; Direct Control of the Retinal Field (an informal communication), Professor George T. Ladd; Consciousness and Time, Professor Charles A. Strong; Some Conditions of Will Development, Brother Chrysostom. Saturday morning: Discussion on Consciousness and Evolution, Professors William James, E. D. Cope, J. Mark Baldwin, Charles S. Minot, George T. Ladd, and others. Saturday afternoon: An Experiment on the Effects of Loss of Sleep, Professor G. T. W. Patrick; Further Researches on the Psychic Development of Young Animals and its Physical Correlation, Professor Wesley Mills; Variations in the Patellar Reflex as an Aid in Mental Analysis, Professor Lightner Witmer; Experiments on Induced Hallucinations, Professor James H. Hyslop; Cases of Dream Reasoning, Professor W. Romaine Newbold.

In the business session of the Association the following officers were elected: President, Prof. G. S. Fullerton, of the University of Pennsylvania; Secretary and Treasurer, Dr. Livingston Farrand, of Columbia College; Members of the Council, Professors Edward H. Griffin of Johns Hopkins and Edmund C. Sanford of Clark. On nomination by the council, the following new members were also elected: Prof. E. D. Cope, University of Pennsylvania; Prof. C. S. Minot, Harvard Medical School; Mr. J. E. Low, Harvard Psychological Laboratory; Mr. E. A. Singer, Harvard Psychological Laboratory; Dr. N. Wild, Columbia College; Dr. C. H. Bliss, University of the City of New York; Dr. Franz Boas, American Museum of Natural History, New York; Mr. Warner Fite, Williams College; Dr. J. E. Creighton, Cornell University; Dr. H. Austin Aikins, Western Reserve University; Dr. W. G. Smith, Smith College.

On motion of Prof. Baldwin of Princeton it was voted that a committee of five be appointed to consider the advisability of formulating a plan for a set of systematic physical and mental tests to be undertaken jointly by various psychological laboratories interested, and to report on the same at the next meeting of the Association. The committee as appointed is as follows: Profs. Baldwin, Jastrow, Sanford, Witmer and Cattell.

The formation of a Philosophical Society, or, more exactly, the partition of the Association into two coördinate sections, one devoted strictly to psychology, the other to philosophy, was discussed informally, and by vote of the Association referred to the Council with the request that they canvass the matter and report at the next meeting.

It was also voted that any members attending the International Psychological Congress in 1896 should receive authorization to act as delegates of the Association on communication with the secretary, Dr. Farrand.

The time and place of the next annual meeting were left for the decision of the President of the Association.

BOOKS RECEIVED.

- AARS. Untersuchungen über Farbeninduktion. Pp. 15, 3 charts. Kristiania, 1895.
- ALLIN. Ueber das Grundprincip der Association (Inaug. Dis.). Pp. 81. Berlin, 1895. Mayer and Müller. Reviewed in this number.
- BEAUNIS and BINET. L'Année Psychologique. Alcan, Paris, 1895. Price 10 f.
- CHASLIN. La confusion mentale primitive, stupidité, démence aigue, stupeur primitive. Pp. ix-264. Paris, Asselin et Houzeau, 1895. Reviewed in this number.
- COMSTOCK. Manual of Insects. Pp. 701. Comstock Pub. Co., Ithaca, 1895. Price \$3.75. Reviewed in this number.
- DONALDSON. Growth of the Brain. Contemporary Science Series, Scribner's Sons importers. Price \$1.25.
- FOUILÉE. Tempérament et caractère selon les individus, les sexes et les races. Pp. 378. F. Alcan, Paris, 1895. Reviewed in this number.
- FRASER. Philosophy of Theism. Being the Gifford Lectures Delivered before the Univ. of Edinburgh in 1894-95. First Series, 1895, pp. 303. Imported by Chas. Scribner's Sons. Price \$2.00.
- GROOS. Die Spiele der Thiere. Pp. xvi-359. Gustav Fischer, Jena, 1896. Price 6 m. Reviewed in this number.
- HEINRICH. Die moderne physiologische Psychologie in Deutschland. Pp. 235. E. Speidel, Zurich, 1895. Price 4 m.
- JERUSALEM. Urtheilsfunction. Braumüller, Wien, 1895.
- KUELPE. Outlines of Psychology. Based upon the results of experimental investigation. Translated from the German (1893) by Edw. B. Titchener. Pp. 462. Macmillan & Co., 1895. Price \$2.60. Notice in this number.
- LEFEVRE. Obligation morale et idéalisme. Pp. 157. F. Alcan, Paris, 1894.
- LE MAITRE. Contribution à l'étude des états cataleptiques dans les maladies mentales. Pp. 96. G. Steinheil, Paris, 1895. Reviewed in this number.
- ROARK. Psychology in Education. American Book Co., New York, 1895. Price \$1.00.
- SCHWARZ. Die Umwälzung der Wahrnehmungshypothesen durch die mechanischen Methode. Nebst einem beitrage über die Grenzen der Physiologischen Psychologie. Pp. 213. Duncker & Humblot, Leipzig, 1895. Price 9 m. Reviewed in this number.
- STANLEY. Studies in the Evolutionary Psychology of Feeling. Pp. 392. Macmillan, 1895. Price \$2.25. Reviewed in this number.
- WATSON. Hedonistic Theories from Aristippus to Spencer. Pp. 248. Macmillan & Co., New York. Price \$1.75.